AWEMAC

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) FINAL REPORT FOR THE PROPOSED VIPINGO MIXED USE DEVELOPMENT MASTER PLAN, KILIFI COUNTY

NEMA REF: NEMA/ SEA/5/2/046

VIPINGO DEVELOPMENT LIMITED
A member of Centum Group

JUNE 2022

PROJECT

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) FINAL REPORT FOR THE PROPOSED VIPINGO MIXED USE DEVELOPMENT MASTER PLAN IN KILIFI COUNTY

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DOCUMENT CONTROL

This document and its contents have been prepared by Africa Waste and Environment Management Centre (AWEMAC) and are intended solely for Vipingo Mixed Use Development Limited and use in relation to Strategic Environmental Assessment Final Report for The Proposed Vipingo Mixed Use Development Master Plan for 10,254 Acres of land between Mtwapa and Kilifi Town in Kilifi County.

Document history:

SN.	Purpose description	Originated	Received by	Authorised	Date
1	Acknowledgment of Screening Report	AWEMAC	NEMA	Vipingo Development Limited (VDC)	4th January 2016
2	Acknowledgment of Master Plan Brief	AWEMAC	NEMA	NEMA	12th January 2016
3	Acknowledgment of Scoping Report	AWEMAC	NEMA	NEMA	24th February 2016
4	Address of Comments raised in the Scoping Report	AWEMAC	NEMA	NEMA	26th February 2016
5	Acknowledgment of Comments raised in the Scoping Report / request for meeting by NEMA	AWEMAC	NEMA	NEMA	9th March 2016
6	Meeting with NEMA on the Scoping Report	NEMA	AWEMAC	NEMA	14th March 2016
7	Acknowledgement of the improvement comments raised in the Scoping Report / More comments Raised by NEMA	AWEMAC	NEMA	NEMA	30th June 2020
8	Addressed issued raised by NEMA on Scoping Report	AWEMAC	NEMA	NEMA	23rd April 2020
9	Approval of the scoping Report to proceed to Draft SEA	NEMA	AWEMAC	NEMA	5th October 2020
10	Acknowledgement of Draft SEA report	NEMA	AWEMAC	NEMA	26th April 2021
11	Publishing of Newspaper/Radio/Kenya Gazette adverts	AWEMAC	NEMA	NEMA	7th to 11th June 2021
12	Approval to Organise a validation workshop	NEMA	AWEMAC	NEMA	16th August 2022
13	Stakeholders Validation Workshop	NEMA	AWEMAC	NEMA	26th August 2021 at Mnarani Club, Kilifi County
14	Submission of Final SEA Report	AWEMAC	NEMA	VDC	June 2022

DECLARATION PAGE

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) FINAL REPORT FOR THE PROPOSED VIPINGO MIXED USE DEVELOPMENT MASTER PLAN IN KILIFI COUNTY, KENYA

DECLARATION BY THE ENVIRONMENTAL CONSULTANT

I, **Prof. Jacob K. Kibwage,** on behalf of Africa Waste and Environment Management Centre, submit this Strategic Environmental Assessment Final Report for the proposed Vipingo Mixed Use Development Master Plan for 10,254 Acres of land between Mtwapa and Kilifi town in Kilifi County. To my knowledge, all information contained in this report is accurate and a truthful representation of all findings as relating to the proposed Master Plan Development as per master plan designs, description and information provided by the proponent.

Signed at NAIROBI on this 24th ***day of*** June ***2022***

Signature: .....

Designation: SEA Team Leader/ EIA/Audit Lead Expert Reg. No. 0126

DECLARATION BY THE PROPONENT

I, Kenneth Kitonga Mbaa, on behalf of **VIPINGO DEVELOPMENT LIMITED,** submit this Strategic Environmental Assessment Final Report for the proposed Vipingo Mixed Use Development Master Plan for 10,254 Acres of land between Mtwapa and Kilifi town in Kilifi County. To my knowledge, all information contained in this report is accurate and a truthful representation of all findings as relating to the proposed Master Plan Development designs, descriptions, and information we provided to the SEA consultant.

Signed at NAIROBI on this 24 ***day of*** June ***2022***

Signature. .....

Designation: Managing Director

TEAM OF SEA EXPERTS

Table below highlights the qualifications and roles for the team of experts involved in the SEA process.

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LIST OF ACRONYMS

CBD	Central Business District
CDA	Coast Development Authority
CIDP	County Integrated Development Plan
CO_2	Carbon (IV) Oxide
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Co-ordination Act
GDP	Gross Domestic Product
GHGs	Greenhouse Gasses
GIS	Global Information Systems
GoK	Government of Kenya
ICT	Information, Communication & Technology
KEBS	Kenya Bureau of Standards
KEFRI	Kenya Forestry Research Institute
KMFRI	Kenya Marine and Fisheries Research Institute
KFS	Kenya Forest Service
KIMAWASCO	Kilifi-Mariakani Water and Sewerage Company
KNBS	Kenya National Bureau of Statistics
KWS	Kenya Wildlife Services
M&E	Monitoring and Evaluation
MEAs	Multilateral Environmental Agreements
MTEF	Medium Term Expenditure Framework
NCCRS	National Climate Change Response Strategy
NEMA	National Environment Management Authority
NET	National Environment Tribunal
NGO	Non-Governmental Organisation
OSHA	Occupational Safety and Health Act
PPP	Policies, Plans and Programs
PLWD	Persons Living with Disability
SDGs	Sustainable Development Goals
SEA	Strategic Environmental Assessment
SERC	Standards and Enforcement Review Committee
TAC	Technical Advisory Committee
UN Habitat	United Nations Habitat
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WRA	Water Resources Authority

DEFINITION OF TERMS

Agenda 21: A comprehensive plan of action to be taken globally, nationally, and locally by organizations of the United Nations' system governments and major groups that was agreed at the United Nations Conference on Environment and Development (UNCED) in Rio de Janerio in 1992.

Archaeological impact assessment: a study required where potential conflicts have been identified between archaeological resources and a proposed development.

Baseline data: Data that describes issues and conditions at the inception of the SEA. It serves as the starting point for measuring impacts and performance and is an important reference for evaluation.

Biological diversity: means the variability among living organisms from all sources including terrestrial ecosystems, aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, among species, and of ecosystems

Buffer Zone: means distinct or established areas that separate potentially competing users and that serves to lessen the danger of potential conflicts.

Cumulative Impacts: IFC defines cumulative as those impacts that result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones.

Cumulative Impact Analysis: a systematic procedure for identifying and evaluating the significance of effects from multiple activities.

Cultural Impact Assessment: assessment of the impact of a planned project on culture, traditions, values, and norms

Environmental Audit means a systematic evaluation of activities and processes of an on-going project to determine how far these activities and programmes conform with the approved environmental management plan of that specific project and sound environmental management practices

Environment Impact Assessment: means a systematic examination conducted to determine whether a programme, activity or project will have any adverse impacts on the environment.

Environmental Management Plan: means all details of project activities, impacts, mitigation measures, time schedule, costs, responsibilities, and commitments proposed to minimize environmental impacts of activities, including monitoring and environmental audits during implementation and decommissioning phases of a project.

Environmental Monitoring: means the continuous or periodic determination of actual and potential effects of any activity or phenomenon of the environment whether short-term or long-term.

Health Impact Assessment (HIA): is defined as the potential effects of a project on the health of a population/ local communities. Health is a state of complete physical, mental, social, and spiritual wellbeing and not merely a study on diseases.

High water mark means the historical recorded point of the highest level of contact between the water and the shore or bank.

Indicator: A signal that reveals progress (or lack thereof) towards objectives; it provides a means of measuring what actually happens against what has been planned in terms of quantity, quality, and timeliness.

Lead Agency: means any Government Ministry, Institution, Department, Parastatal, State Corporation or Local Authority, in which any law vests functions of control or management of any element of the environment or natural resources

Low water mark means the historical recorded point of the lowest level of contact between the water and the shore or the bank as the case may be.

Integrated Environmental Assessments: includes Environmental Impact Assessment, Archaeological Assessment, Social Impact Assessment, Health Impact Assessment and Cultural Impact Assessments.

Master plan: a dynamic long-term planning document that provides a conceptual layout to guide future growth and development. Master planning is about making the connection between buildings, social settings, and their surrounding environments.

Mitigation measures include engineering works, technological improvements, management, and ways and means of minimising negative aspects, which may include socio-economic and cultural losses suffered by communities and individuals, whilst enhancing positive aspects of the project**.**

Plan: A purposeful, forward-looking strategy or design, often with coordinated priorities, options, and measures that elaborate and implement policy.

Policy: A broad statement of intent that reflects and focuses the political agenda of government and initiates a decision cycle. A general course of action or proposed overall direction that a government is or will pursue; a policy guides ongoing decision making.

Program: A coherent, organized agenda or schedule of commitments, proposals, instruments, and/or activities that elaborate and implement policy.

Riparian land: means land being a minimum of 6 metres and up to a maximum of 30 metres on either side of a riverbank from the highest water mark.

Scoping: The process of defining the extent and detail of a SEA, including the identification of strategic issues.

SEA Expert: An expert registered and licensed as per the SEA Guidelines

Social Impact Assessment (SIA): is the process of identifying and managing the social / human impacts of projects

Stakeholder: Those who may be interested in, potentially affected by, or influence the implementation of a PPP. In the context of a SEA applied to development co-operation, stakeholders may include government, donor agencies, local communities, NGOs, and civil society.

Strategic Environmental Assessment (SEA): A range of analytical and participatory approaches that aim to integrate environmental consideration into policies, plans, and programs and evaluate the interlinkages with economic and social considerations.

Sustainable Development means development that meets the needs of the present generation without compromising the ability of future generations to meet their needs by maintaining the carrying capacity of the supporting ecosystem.

Tier: A layer or ranking in a hierarchy, as in policy, plan, or program.

Threshold: Levels that should not be exceeded; points at which irreversible or serious damage could occur, either to ecosystems and/or to social systems (health, safety, or wellbeing).

Trade-offs: Refers to losing one quality or aspect of something in return for getting another quality or aspect. It implies a decision made with the full comprehension of both the up- and down-side of a choice.

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NON -TECHNICAL SUMMARY

Background Information

Vipingo Development Limited, a wholly owned subsidiary of Centum Investment Company Limited owns approximately 10,254 Acres of land between Mtwapa and Kilifi Town, Kilifi County. The proponent has proposed to develop the most cost-effective place to set up and do business in East Africa in a way that competitively addresses ease of doing business. The proposed economic hub is anchored on providing the most cost-effective place to do business that is supported by high quality infrastructure, amenities, services, urban environment with access to quality skilled and non-skilled labour.

The proposed mixed use development site is 30 kilometres from the Port of Mombasa and Moi International Airport Mombasa and 40 kilometres from the Mariakani Logistics Hub. It lies about 80 kilometres to Malindi Port and approximately 300 kilometres to Lamu Port. The area is approximately 45 kilometres from Kilifi town and roughly 90 kilometres from Malindi Town. The development area is located along the Mombasa– Malindi -Lamu Highway. The development's vision is to develop a green (sustainable) economic hub of the future in Kenya that will become a sought-after business destination in East Africa and beyond. The development envisions integrating first world premium facilities comprising the following zones: industrial, residential, commercial, institutional, recreational and public zones. The development will provide high quality of life; environmental sustainability and competitive economics that will make the development compete economically and commercially with other cities in the world as the business and residential location of choice. The project will be supported by high quality, reliable, cost effective and sustainable state of the art infrastructure.

Africa Waste and Environment Management Centre (AWEMAC) (a NEMA Registered and Licenced firm of EIA Experts Reg. No. 0527) was contracted by Vipingo Development Limited to carry out a Strategic Environmental Assessment (SEA) of the proposed Vipingo Mixed Use Development Master Plan in fulfilment of Environmental Management and Coordination Act (EMCA Cap 387) section 57, SEA Guidelines of 2012 and Regulation 42 of the Environmental (Impact Assessment and Audit) Regulations of 2003 that requires all Policy, Plans or Programmes to be subjected to a SEA. The SEA commission entailed carrying out the study in accordance with the set regulations and guidelines, submission of the scoping, draft and final SEA reports to NEMA for review, and follow up to provide any additional information to enable approval of the Master Plan.

The purpose of this Final SEA report is to share the findings of the possible impacts on the bio-physical and socio-economic environment upon implementation of the proposed Master Plan. It also seeks to provide information on the plan proponent, an outline of the proposed plan, mitigation measures for identified negative impacts, an environmental management and a monitoring plan to ensure effective implementation of the mitigation measures, and a description of the SEA process including the assessment's outcomes and recommendations.

Methodology and Criteria for undertaking the SEA

The SEA was carried out in line with the provisions of the Environmental Management and Coordination Act, (EMCA, Cap 387), the Environmental (Impact Assessment and Audit) Regulations 2003, Draft Environmental Management and Coordination (Strategic Assessment, Integrated Impact Assessment and Audit) Regulations 2018, the 2012 National Guidelines for Strategic Environmental Assessment in Kenya, as well as international guidelines on SEA.
The main activities in this SEA study include:

a) Description of the proposed Plan including the objective, purpose, and rationale;

b) Identification of alternative options and strategies, implementation plan and time scale;
c) Areas and sectors affected by the proposed Plan;
d) Field missions for baseline environmental analysis;
e) Collection of baseline data including data on ecological processes and services, resilience and vulnerability of these processes and their significance to human well-being;
f) Review and analysis of existing policy and legislative frameworks for environmental protection and existing environmental protection programs and their objectives;
g) Review of all relevant development plans for the area within the study boundaries;
h) Identification of alternatives options and justification of preferred alternatives and linkages between ongoing projects and proposed plan;
i) Integration of climate change vulnerability assessment, adaptation and mitigation actions;
j) Prediction and evaluation of impacts, including cumulative effects;
k) Preparation of an Environmental and Social Management and Monitoring Plan (ESMMP)
l) Institutional Strengthening/ Capacity Building;
m) Identification of gaps and alternatives actions;
n) Stakeholder consultations and public participation;
o) Presentation of findings and stakeholder dialogue;
p) Compilation, validation and submission of final SEA report;

Objectives of the Master Plan

The specific objectives of the SEA are outlined below.

i. To support time-efficient and cost-effective development planning by avoiding the need to reassess some issues and impacts at project level.
ii. To inform decision makers by evaluating alternative options that meet the Masterplan's objective(s), while also being the best-practicable-environmental-option(s);
iii. To integrate environmental principles into the development, appraisal, and selection of Masterplan's options e.g. selection of green technologies for the development.
iv. To provide an early opportunity to check whether the Masterplan complies with County, national and international environmental policy and consequent legislative obligations.
v. To enhance proper forward-thinking in planning and zonation of various land uses to avert the risks and consequences of a poorly planned development.
vi. To identify environmental and poverty-combating priorities and how these may be influenced by the proposed Masterplan.
vii. To ensure that conservation of biodiversity is at the core of the Masterplan formulation and implementation.
viii. To support decision-making and incorporate emerging environmental issues into sustainable development of the proposed city.
ix. To identify environmental impacts and integrate mitigation measures during Masterplan formulation, and in the process, enhance Environmental Management
x. To ensure the consideration of cumulative, indirect, or secondary impacts and other unintended consequences when planning multiple, diverse activities of the Masterplan.
xi. To ensure that the proposed Masterplan is compatible with sustainable environmental planning and management.
xii. To ensure the consideration of alternative Masterplan options, including the do-nothing option, at an early stage when an agency has greater flexibility.

xiii. To enhance the consistency of the Masterplan across different sectors including the Big Four Agenda (Enhancing Manufacturing, Food Security and Nutrition, Universal Health Coverage, Affordable Housing).

Proposed Master Plan description

The intended Vipingo master plan will comprise of several spatial land use patterns, which will include 28% residential, 20% industrial, 15% commercial, 4% on sisal and 3% education. Others will consist of utilities and open space. The following provides details of the proposed facilities:

Residential Zone - The residential area will have low, medium and high density of people. The residential area target market includes both middle income earners and high-end earners. Approximately 3,250 acres of land will be utilized for this zone, which comes to about 28% of total land area. It is anticipated that 219,000 residents will occupy the development area.

Office and Commercial Zone- This zone has various facilities that include the shopping arcade that is convenient for shopping, office parks providing various offices, show rooms and retail malls. About 15% of land or 1,750 acres will be utilized for this zone. Out of this, 1400 acres will be for mixed-development.

Industrial Zone - The industrial zone will cover 2,350 acres, which is 20% of the land and will have distribution warehouses and an industrial park that includes light and heavy industries such as Metal and allied, Technology park; Agro industries, Apparel and textile, Fast-moving consumer goods (FMCG), Pharmaceuticals, Plastics & rubber –Permitted Polythene Bags, Paper and Board, cartons, Permitted Poly Propylene Bags, Footwear.

Hospitality Zone - This zone will host a 5 star and a 3-star hotel and resort together with conference facilities. It will also include entertainment facilities such as amusement parks among others.

Institutional zone - This zone has various facilities including hospital (both private and public), clinics and dispensaries, universities, sports academies and stadium, church, mosques and schools (Nursery schools, primary, high schools and Universities). The educational facilities will occupy 300 acres (3%) of land; a total of 10,000 university students and 87,500 primary and secondary students are expected.

Recreational and Sport Activities Zones - These include nature trails, water sports, spa, gym, tennis, cycling, swimming, basketball, mini-soccer pitch, kids play areas, yachting and outdoor landscape events areas. The sports stadium will have a seating capacity of 5,000 – 7,000. 1,200 acres or 10% of total land will be occupied by open space, of which 700 acres will be for active recreational parks

Support Trunk infrastructure - These include: road infrastructure, reliable power distribution network, abundant domestics and industrial water supplies, waste water collection network, treatments and recycling facilities, telecommunication facilities, firefighting facilities and beautifully landscaped open space for leisure. Utilities such as electrical generation and distribution, solar fields, drinking water treatment plant, wastewater treatment plant and solid waste management are expected to cover 550 acres of land (5%).

Parks and Agricultural Pockets - Some parcels of the land are set aside for green spaces such as parks, playgrounds and open spaces with adequate space provided and buffer zones for water bodies.

Progress attained in Vipingo Mixed Use Development Master Plan implementation

Phase one is expected to occupy approximately 700 acres. It is anticipated that it will host 20,000 people, excluding day time population, with 5,000 housing units ranging from low, medium and high density. Implementation of phase one (1) commenced in March 2016 featuring various land uses highlighted below;

i.	Industrial	310 acres	44%
ii.	Residential	140 acres	20%
iii.	Commercial	10 acres	1%
iv.	Institutional (University, school, hospital)	40 acres	6%
v.	Open space	50 acres	5%
vi.	Water bodies	10 acres	1%
vii.	Utilities	90 acres	13%
viii.	Transportation	50 acres	7%
Total		**700**	**100%**

The following Phase 1 projects are at various stages;

- Infrastructure Development– which included road works - road infrastructure, road furniture, foot paths, culverts & drainage; reliable power distribution network including electrical installations (street lighting) and duct works (electrical); abundant domestics and industrial water supply; waste water collection network, treatment and recycling facilities; telecommunication facilities; firefighting facilities; landscaped open space for leisure; and water reticulation - inclusive of tanks and pipework – **(completed**)
- Awali Estate – maisonettes and bungalows **(completed)**
- 1255 Palm Ridge – 440 affordable Apartments **(under construction)**
- Sea water desalination plant – 3 million liters per day **(commissioning stage)**
- Vipingo Leisure Centre- Shopping mall – 10,000 sq.m **(under construction)**

The proposed Vipingo Mixed-use Development is anticipated to interlink with other national, regional and County - local policies, plans and programmes. Some of the key interlinkages include;

a) Linkage at National Level
   - Vision 2030
   - The Government of Kenya's Big Four Agenda (GoK, 2018)
   - The Big Four Tourism Plan 2030
   - National Biodiversity Strategy and Action Plan, 2000(GoK, 2000)
   - Agricultural Sector Development Strategy 2010-2020 (GoK, 2010)
   - National Water Master Plan 2030(GoK, 2013)
   - The National Spatial Plan (NSP) Framework
   - The Lamu Port South Sudan Ethiopia Transport (LAPSSET) Corridor

b) Linkage at Coast / Regional Level
   - Master Plan on Logistics in Northern Economic Corridor
   - Integrated Coast Region Master Plan (2010-2030)
   - Mombasa County Integrated Development Plan (2018-2022)

c) Linkage at County Level
   - Kilifi County Integrated Development Plan 2018-2022
   - Kilifi County Spatial Plan

Baseline Environmental Analysis

Vipingo is situated within Kilifi South Constituency in Kilifi County. Kilifi County borders Mombasa County to the South, Kwale County to the South West, Taita Taveta County to the West, Tana River County to the North and the Indian Ocean to the East. Kilifi County covers a total

surface area of 12,610 km^2 and accounts for 2.17 per cent of Kenya's total surface area. It is located between longitudes 39.85 East and latitudes -3.6333333 South.
The steps followed during the environmental baseline situation analysis were as follows:

- Environmental screening and scoping of the proposed Master Plan land uses
- Desktop studies
- Physical inspection of the proposed development area and surrounding Master Plan areas

Environmental issues were categorized into physical, biological/ecological, socio-cultural, and socio-economic components of the proposed Master Plan.

- **Physical Environment** – topography, landforms, geology, soils climate and meteorology, air quality, hydrology etc.;
- **Biological Environment** - i.e. fauna and flora types and diversity, endangered species, sensitive habitats, wildlife within protected areas and other dispersal areas etc.; and Marine resources and conservation areas (Fisheries resources; Mangrove forest; Coral reefs)
- **Social economic environment** (including present and projected, where appropriate) - i.e., demography, agricultural activities (Sisal plantations; Subsistence crop growing; Subsistence livestock keeping), land use, planned development activities within the subproject area, employment and labour market, sources and distribution of income,
- **Socio-cultural** community structure, cultural properties, social protection, and cultural issues) etc.

Relevant policy, plan, legislative and regulatory framework

The proposed Vipingo Mixed Use Development Master Plan was subjected to a comprehensive analysis based on the environmental obligations' framework developed for the SEA. Key legislations and pertinent regulations studied and reviewed in detail including multilateral environmental agreements / treaties in the SEA report include:

- The Constitution of Kenya (2010)

Key Policies Relevant to the SEA

- National Environmental Policy
- The National Housing Policy 2004
- The National Industrialization Policy Framework for Kenya 2012-2030
- Public Health Policy of 2014-2030
- HIV/AIDS Policy of 2009
- Kenya National Policy on Gender and Development (NPGD), 2000
- The Integrated Coastal Zone Management (ICZM) Policy, 2007 & Draft 2013
- The Regional Development Authorities Policy, 2007
- The National Oceans and Fisheries Policy, 2008
- The Sessional Paper No.4 on Energy, 2004
- The National Climate Change Response Strategy (NCCRS), 2010
- Sessional Paper No. 3 of 2009 on National Land Policy
- Sessional Paper, No. 1 of 2017 on National Land Use Policy
- Kenya Environmental Sanitation and Hygiene Policy 2016 – 2030

Legal Framework / Laws

- Environmental Management and Co-ordination Act (EMCA) Cap 387
- Water Act, 2016
- The Energy Act, 2019
- Forest Conservation and Management Act, No. 34 of 2016;
- Climate Change Act, 2016
- Maritime Zones Act (Cap 371)
- Coast Development Authority Act (Cap 449)
- Kenya Ports Authority Act
- The Agriculture, Fisheries and Food Authority Act of 2013
- Fisheries Management and Development Act, No. 35 of 2016
- Land Act, No. 6 of 2012
- The Land Registration Act, No. 3 of 2012
- The Environment and Land Court Act, No. 19 of 2011

- The National Land Commission Act, No. 5 of 2012
- Physical and Land use Planning Act, 2019
- County Governments Act, No. 17 of 2012
- Urban Areas and Cities Act, No. 13 of 2011
- Occupational Safety and Health Act, No. 15 of 2007
- Work Injury Benefits Act, 2007 (Revised Edition, 2012)
- Public Health Act (Cap. 242)
- Food, Drugs and Chemical Substances (Cap 254)
- Employment Act, 2007 (Revised Edition, 2014)
- Penal Code Act (Cap 63)
- Kenya Information and Communications Act, 1998 (Revised Edition, 2015)
- Industrial Property Act, No. 3 of 2001
- Consumer Protection Act, 2012 (Revised Edition, 2016)
- Basic Education Act, 2013 (Revised Edition, 2017)
- The Traffic Act (Cap 403)
- The National Gender and Equality Act, 2011
- National Museums and Heritage Act, No. 6 of 2006;
- HIV and AIDS Prevention and Control Act, 2006 (Revised Edition, 2014)
- The Sexual Offences Act, 2006 and its amendment 2012
- Persons with Disabilities Act, 2003 (Revised Edition, 2016)

Multilateral Environmental Agreements / Treaties

- Vienna Convention on the Protection of the Ozone Layer
- United Nations Convention on Biological Diversity (UNCBD)
- African Convention on the Conservation of Nature and Natural Resources
- The World Commission on Environment and Development (The Brundtland Commission of 1987)
- The Ramsar Convention for the conservation and sustainable utilization of wetlands
- United Nations Convention to Combat Desertification (UNCCD)
- The 1992 United Nations Framework Convention on Climate Change (UNFCCC)
- Earth Summit on Sustainable Development Agenda 21
- United Nations Convention on the Law of the Sea (UNCLOS)
- Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972)
- The UNEP's Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA)
- The UNEP's Regional Seas Programme
- Convention on the Elimination of all forms of Discrimination against Women
- International Labour Organization (ILO) Conventions
- Sustainable Development Goals (SDGs)

Stakeholder Engagement and Public Participation / Disclosure process

Key Government Ministries and Lead Agencies, Kilifi County Government officials, private investors, interested and affected individuals and institutions within and neighbouring the proposed Vipingo Development were consulted in the Strategic Environmental Assessment (SEA) study. In total, approximately 73 stakeholders were identified/mapped and consulted during the SEA exercise. The exercise was conducted by experienced experts via interviews and discussions under the guidance of interview schedules developed to capture the general and specific concerns, comments and issues comprehensively. In general, the following steps were followed in carrying out the SEA public consultation process: -

- Identification and compiling a database of interested and affected individuals and institutions
- Interview schedules were designed to different target groups and local community members in the proposed Master Plan.
- Public meetings in the villages/local centers and around the proposed mixed-use development area

- Key Stakeholders Meetings at various levels and with different target groups in Kilifi County

The public consultation and participation was conducted through:

- ***Household interviews and socio-economic survey;*** Interviews were conducted within the entire neighbourhood of the proposed development. Survey tools were prepared for effective and systematic interviews by the environmental and socio-economic consultants assisted by a team of technical field assistants**.** The purpose for such interviews was to identify the positive and negative impacts that have been studied in detail in chapter 6, 9 and 10 of this SEA report and subsequently promote proposals on the best practices to be adopted and mitigate the negative impacts respectively.
- ***Public participation meetings and 1st key stakeholders meeting;*** Consultative meetings were continuously held during the SEA exercise to deliberate on the issues affecting the proposed Vipingo Mixed Use Development Master Plan as well as capturing issues raised by various stakeholders. Four (4) public meetings and the 1st key stakeholder meeting were held on various dates in January 2016, with the local residents, chiefs, village elders, county officials, national government agencies' representatives and other local administrative leaders in attendance attracting more than 1,000 participants.
- ***2nd Key stakeholders Meeting held in December 2020;*** In order to ensure adequate public participation at draft SEA stage, a 2nd Key stakeholders consultative meeting was planned in the months of November to December 2020. Invitation letters were sent to the mapped stakeholders including key national agencies and Kilifi County government ministries, government departments operating in Kilifi, local representatives from the community amongst others who in one way or another are likely to interact with the proposed Vipingo Mixed Use Development. The 2nd Key Stakeholders meeting was held on Tuesday, 15th December 2020 at Bofa Beach Resort in Kilifi County with total attendance of 36 stakeholders
- ***Public Review:*** Following the submission of the draft SEA report to NEMA on 26th April 2021, at the cost of the client, NEMA published the draft SEA advert in the Daily Nation of 8th June 2021, Standard Newspaper of 7th June 2021, Kenya Gazette of 11th June 2021 and KBC radio on 11th June 2021 which invited the public to make oral or written comments on the draft SEA report and allowed for the public disclosure period. The purpose of the adverts was to allow all stakeholders to read and understand how they would be affected by the proposed mixed-use development.
- ***Validation Workshop held on 26th August 2021:*** In view of the expiry of the public disclosure period, Vipingo Development Limited in coordination with NEMA organised for a validation workshop that was held on 26th August 2021 with a total of 44 participants. The main objective of the workshop was to present and validate the draft Strategic Environmental Assessment (SEA) report for Vipingo Mixed Use Development Master Plan. The meeting was intended to receive oral or written comments from stakeholders to integrate environmental and social considerations into the final Strategic Environmental Assessment (SEA) report of the Master Plan for purposes of ensuring its long-term sustainability.

Key stakeholders' recommendations during the Final SEA process for Vipingo Development Limited management included: -

- Water conservation and wastewater management
- Adoption of a comprehensive solid waste management
- Establishment of Non-Motorised Transport (NMTs) facilities

- Empowering the local population (especially youths) through active participation in the implementation of the Master Plan
- Biodiversity conservation / Protection of riparian land and the beach
- Implementing Corporate Social Responsibility program to enhance the lives of the surrounding community
- Adoption of green building technologies
- Conducting a baseline study of the Ocean Ecosystem

All stakeholder comments and NEMA recommendations have been incorporated in this Report.

Alternative options of the Master Plan

The SEA identified six possible alternatives/ options to which the land can be used. They include: Option 1-No Development, Option 2-Wildlife Conservancy Use, Option 3-Farm Land / Agricultural Use Option and Option 4 -Proposed Mixed Use Master Plan Development. The likely environmental and socio-economic impacts of each option were assessed. The results were analysed, reported descriptively and quantitatively. Given the results of the analysis, the Proposed Mixed-Use Masterplan Use (Option 4) was preferred. This will result to optimal use of the proposed plan area to reap maximum sustainable benefits. Considering that the preferred option is going to have sustainability features, such as incorporation of renewable energy and eco-designs, this will go a long way in ensuring wise use of resources and boost conservation efforts in the region. Agriculture will continue to be practiced in the agricultural zones thus not eliminating this practice in the area. The open spaces/green areas/parks will provide a refuge habitat to the existing fauna. This zone will support the preserved indigenous trees in other zones together with those planted during the proposed afforestation programmes to act as carbon sinks in the area. The proposed Vipingo Mixed Use Master Plan is thus expected to integrate all the facets of a sustainable development by ensuring that the economic, social and environmental factors are the guiding principles in the design, construction and management of the mixed-use development.

Impacts Identification and Analysis

The following table presents the anticipated key negative impacts and proposed mitigation measures for the proposed Vipingo Mixed Use Development Master Plan.

Table 0-1 Summary of key impacts

Possible impacts	Mitigation measures
Ecological imbalance due to loss of agricultural land and destruction of natural habitats for the local flora and fauna thus reducing biodiversity in the area	▪ EIAs to be undertaken for all development activities ▪ Maintain the proposed green spaces as per the Master Plan ▪ Where clearance of native vegetation is inevitable, consider introducing such natives in landscaped and other green spaces to compensate for the loss ▪ Protection of the riparian environment and establishment of a riparian reserve management plan ▪ Ensure all projects comply with the Environmental Management and Co-ordination (Conservation of Biological Diversity and Resources, and Access to Genetic Resources and Benefits Sharing) Regulations, 2006.
High generation of solid and effluent waste from residential, commercial and industrial areas	▪ Adoption of an integrated solid waste management plan through a hierarchy of options that includes reduction at source, reuse, recycling, incineration, composting and land filling ▪ Domestic, commercial and industrial waste to be collected and managed separately ▪ Provide mechanisms to segregate wastes at source to enable recycling ▪ Pre-treatment of industrial effluent before discharge into sewers ▪ Undertake EIA for all development activities ▪ Conduct waste Audits annually and other statutory and non-statutory reports ▪ Compliance to Environmental Management and Co-ordination (Waste Management) Regulations 2006 and (Water Quality) Regulations 2006
Increased demand on water sources	▪ Ensure implementation of Integrated Water Resources Management (IWRM) including promoting recycling and reuse of water as much as possible ▪ Adopt green building water use technologies such as low volume water fixtures in proposed development and projects ▪ Development of storm water management plan with design strategies for storm water treatment and filtration systems. Such would entail use of recycled and harvested storm water in cleaning and Landscaping ▪ Incorporate water accounting systems and metering for all areas ▪ Limited abstraction of river water and instead use of alternative sources of water such as roof catchment rain water harvesting and harvesting of flood waters ▪ Pre-treatment of all effluent before discharge into environment ▪ Undertake a hydrogeological study in collaboration with WRA to determine the sustainable ground water abstraction levels ▪ Undertake EIA for all development activities

Possible impacts	Mitigation measures
	▪ Ensure all project comply to the Water Act, 2016 and Environmental Management and Co-ordination (Water Quality) Regulations 2006
Increased energy consumption	▪ Institution awareness programmes to conserve energy ▪ Energy conservation through installation/use of energy efficient appliances / fittings ▪ Adoption of green energy sources e.g. solar energy, waste to energy projects ▪ Use of green building designs that allow for passive heating and cooling, and maximum utilization of natural light in buildings ▪ Continually seek avenues for energy conservation as international best practices evolve ▪ Carry out Energy Audits and ensure all projects comply with The Energy Act 2019 and subsidiary legislation under the Energy Act
Environmental and Landscape Changes	▪ Undertake EIA for all development activities ▪ Ensure adequate tree cover and gardens within developed areas to provide shade and cooling effect ▪ Ensure adequate drainage of the site through drainage works ▪ Plenty of gardens and green areas within developed areas will enable percolation of rainfall and reduce runoff ▪ Ensure plenty of vegetation cover (trees and shrubs) as buffers between land-uses to reduce noise effects ▪ Enforcement of pollution control measures for air pollution sources ▪ Tarmacking all major roads to enhance movement in all-weather and to avoid dust generation
Traffic and Transport	▪ Provision of adequate vehicular circulation space and parking areas ▪ Adoption of non-motorized transport (NMT) program and facilities including cycling, walking, use of wheelchairs, scooters, hand carts, skates, skateboards amongst others. ▪ Provision of pedestrian walkways along all roads within the development ▪ Paving all pedestrian walk ways with robust, durable, and non-slippery materials ▪ Provision of all necessary street furniture along all roads within the development to accommodate users (including the disabled, elderly, and children) and to enhance security. ▪ Provision of bollards in appropriate areas to prevent vehicles from encroaching into the pedestrian domains. ▪ Provision of street lights to provide sufficient light for both pedestrian areas and carriage ways. ▪ Provision of trees along pedestrian walkways for shading and that require minimum maintenance; preferably indigenous for ecological and cultural advantages.

Possible impacts	Mitigation measures
	▪ Ensure Installation and maintenance of all construction signs, signals, markings, and other devices used to regulate traffic, including posted speed limits, warnings of sharp turns, or other special road conditions ▪ Development of a Traffic Management Plan and compliance to Traffic Act, 2014
Greenhouse Gases Emissions	▪ Use of renewable sources of energy ▪ Retention of green spaces/landscaped spaces as carbon sinks ▪ Adoption of green buildings technology ▪ Adoption of efficient transport system ▪ Continually seek avenues for energy conservation as international best practices evolve ▪ Annual air quality monitoring ▪ Ensure compliance of The Environmental Management and Co-ordination (Air Quality) Regulations, 2014
Socio- Economic Concerns	▪ Maximize the recruitment of locals where possible and have a Labour Management Plan to ensure workers' labour rights including health and safety and are protected ▪ Develop community awareness programmes to enhance cohesion between project employees and the local community. ▪ Consult with the public and the locals during implementation of proposed developments ▪ Sensitize sisal workers about the proposed mixed-use development and allow for smooth transition ▪ Develop and implement a Livelihood Restoration Plan (LRP) for the sisal plantation workers whose career will be affected during execution of the proposed Vipingo Mixed Use Development Master Plan. ▪ Develop and implement a grievance redress mechanism (GRM) to address concerns of the locals. ▪ Establish a corporate social responsibility (CSR) plan to support key community needs / facilities such as provision of water access to the community at a subsided rate including improvement programs to surrounding school's (such as Rea Vipingo and Shauri Moyo) ▪ Develop a policy for local partnerships with NGOs, national and county government agencies such as Kilifi – Mariakani Water and Sewerage Company (KIMAWASCO) on water supply and learning institution such as Kenya Medical Training College (KMTC) ▪ Ensure public facilities including roads, parks within Vipingo development are aligned with the master plan and protected for accessibility / use by the public

Climate change vulnerability assessment, adaptation and mitigation actions

It is noteworthy that developments with a higher magnitude such as envisioned by the Vipingo development mixed use master plan are major contributors to climate change: At the same time, such developments, cities and towns are heavily vulnerable to climate change. Together with both national and county governments, Vipingo development has the potential to diminish the causes of climate change (mitigation) and effectively protect themselves from the impacts (adaptation). The SEA has established detailed adaptation and mitigation measures that should be considered during the execution of the master plan including;

- Developing strategies to enable non-motorised transport (NMT) which is efficient with low GHG footprint.
- Put in place strategies to enhance energy conservation, efficiency and use of renewable and sustainable energy sources.
- Developing an Integrated Solid Waste Management System.
- Implement integrated water management by having in place local water recycling facilities.
- Develop strategies for waste reduction at source through implementation of Integrated Solid Waste Management Systems (ISWM).
- Increase tree cover in the green and open spaces of the Master plan to greater carbon sequestration, both in the soil and the biomass.

Conclusion and recommendations

The SEA has shown that Vipingo development is a worthy investment that will contribute significantly to the improvement of living standards among the investors and by extension spur economic development both in Kilifi County and neighbouring regions. Upon the master plan execution, the proposed mixed-use development will bring along numerous positive impacts ranging from creation of employment, supply of the much-needed office, retail/commercial/industrial and residential spaces, decongesting the nearby Kilifi, Malindi and Mtwapa towns including Mombasa City. It will lead to optimized land use among other benefits, all aimed at attaining the Kenyan vision 2030 and realizing key tenants of the Big Four Agenda.

The Final SEA has established key recommended Vipingo Master Plan changes including mitigation measures for the Master Plan based on analysed impacts. Recommended Master Plan Changes include: designation of a solid waste management facility, location of industrial zone from residential zone and establishment of storm water treatment / filtration systems anchored on a storm water management plan. Key recommended mitigation strategies should entail;

- Protection of the beach and mangroves
- Protection of riparian land / resources/ wetlands
- Habitat management
- Leverage for controlled urban planning on the Master Plan boundary
- Harnessing power from renewable energy sources to supplement supply from the National Grid
- incorporating green building techniques in construction of individual projects
- Incorporating non-motorized transport facilities (NMT)

It is therefore recommended that the mitigation strategies and ESMMP provided in this SEA report be duly implemented. In line with the EMCA Cap 387, Environmental Impact Assessments should be carried out for all individual projects before construction. The proponent should also ensure that the buffer zones between the various proposed master plan land use zones are

sufficient and sustainable. Taking into consideration the scope and magnitude of the proposed Vipingo Mixed Use Development Master Plan, the anticipated positive impacts, and the mitigation measures provided for identified negative impacts; it is our recommendation that NEMA approves this Final SEA report.

1 INTRODUCTION

1.1 Background Information

Vipingo Development Limited, a wholly owned subsidiary of Centum Investment Company Limited who own approximately 10,254 Acres of land in Kilifi County, have proposed a mixed-use development master plan of the land. The company wants to set up and do business in East Africa in a way that competitively addresses ease of doing business. The site is strategically located between Mtwapa and Kilifi Town. The site is 30 Kilometers from Moi International Airport and Port of Mombasa and 40 Kilometers from the Mariakani Logistics Hub.

Vipingo Development Limited intends to develop a master plan on the 10,254 Acres of land supported by the following basic facilities: controlled mixed-use development, security, water, power, emergency services, health facilities, education facilities, walkability & parking, sustainability and urban management. The development will be carried out in several phases. According to the proponent, design work on the master plan commenced in October 2015.

The proponent's main objective is to develop a green (sustainable) economic hub of the future in Kenya that will become a sought-after business destination in East Africa and Beyond. The proposed economic hub will be anchored on providing the most cost-effective place to do business that is supported by high quality infrastructure, amenities, services, urban environment with access to quality skilled and non-skilled labor.

1.2 Strategic Environmental Assessment Definition

Strategic Environmental Assessment (SEA) refers to a range of analytical and participatory approaches to integrate environmental consideration into Policies, Plans and Programs (PPP) and evaluate the inter-linkages with economic and social considerations (NEMA, 2012). SEA is a combination of approaches that uses a variety of tools, rather than a single, fixed, prescriptive approach. The SEA process extends the aims and principles of Environmental Impact Assessment (EIA) upstream in the decision-making process, beyond the project level, when major alternatives are still possible. SEA is a proactive approach to integrate environmental considerations into the higher levels of decision-making. During a SEA process, the likely significant effects of a Policy, Plan, or Program (PPP) on the environment are identified, described, evaluated, and reported.

1.3 Basic Principles for SEA

The Environmental (Impact Assessment and Audit) Regulations of 2003 and its subsequent revisions provide for SEA in compliance to the following principles:

- The sustainable use of natural resources;
- The enhanced protection and conservation of biodiversity;
- Interlinkages between human settlements and cultural issues;
- Integration of socio-economic and environmental factors;
- The protection and conservation of natural physical surroundings of scenic beauty and the protection and conservation of built environment of historic or cultural significance;
- Public and stakeholder engagement.

1.4 Objectives of the SEA

SEA aims to systematically integrate environmental considerations into, planning, and decision-making processes in an effort to:

- Ensure that a proposed PPP is compatible with sustainable environmental planning and management;
- Ensure the consideration of alternative policy options, including the do-nothing option, at an early time when an agency has greater flexibility;

- Enhance the consistency of a PPP across different policy sectors, and when relevant, make explicit the trade-offs to be made between different sectoral policy objectives;
- Evaluate the regional environmental impacts of multi-sectoral developments over a specified time;
- Support decision-making and incorporate emerging environmental issues into sustainable development
- Guide investment programs that involve multiple sectoral policies or sub-projects;
- Assess the environmental impacts of policies that do not have an explicit environmental dimension;
- Identify environmental impacts and integrate mitigation measures during program formulation, and in the process, enhance Environmental Management Plans;
- Ensure the consideration of cumulative, indirect, or secondary impacts and other unintended consequences when planning multiple, diverse activities;
- Support time-efficient and cost-effective development planning by avoiding the need to reassess some issues and impacts at project level (e.g., when an issue or impact was effectively dealt with at a strategic level);
- Inform decision makers by evaluating alternative options that meet the PPP objective(s), while also being the best-practicable-environmental-option(s);
- Integrate environmental principles into the development, appraisal, and selection of policy options;
- Give adequate attention to environmental considerations in decision making, at par with economic and social concerns, and with a view that trade-offs may be necessary in some situations;
- Provide an early opportunity to check whether a proposal complies with national and international environmental policy and consequent legislative obligations;
- Establish a context that is more appropriate for subsequent development proposals;
- Provide a transparent and accountable decision-making framework.

1.5 Purpose / Rationale of the Vipingo Mixed Use Development SEA report

The general objective of this SEA report is to present strategic recommendations that will guide environmental and socio-economic planning during implementation of the Vipingo Mixed Use Development Masterplan.

1.6 Specific Objectives of Vipingo Mixed Use Development SEA report

The specific objectives of the SEA are outlined below.

i. To support time-efficient and cost-effective development planning by avoiding the need to reassess some issues and impacts at project level.
ii. To inform decision makers by evaluating alternative options that meet the Masterplan's objective(s), while also being the best-practicable-environmental-option(s);
iii. To integrate environmental principles into the development, appraisal, and selection of Masterplan's options e.g. selection of green technologies for the development.
iv. To provide an early opportunity to check whether the Masterplan complies with County, national and international environmental policy and consequent legislative obligations.
v. To enhance proper forward-thinking in planning and zonation of various land uses to avert the risks and consequences of a poorly planned development.
vi. To identify environmental and poverty-combating priorities and how these may be influenced by the proposed Masterplan.
vii. To ensure that conservation of biodiversity is at the core of the Masterplan formulation and implementation.
viii. To support decision-making and incorporate emerging environmental issues into sustainable development of the proposed city.

ix. To identify environmental impacts and integrate mitigation measures during Masterplan formulation, and in the process, enhance Environmental Management
x. To ensure the consideration of cumulative, indirect, or secondary impacts and other unintended consequences when planning multiple, diverse activities of the Masterplan.
xi. To ensure that the proposed Masterplan is compatible with sustainable environmental planning and management.
xii. To ensure the consideration of alternative Masterplan options, including the do-nothing option, at an early stage when an agency has greater flexibility.
xiii. To enhance the consistency of the Masterplan across different sectors including the Big Four Agenda (Enhancing Manufacturing, Food Security and Nutrition, Universal Health Coverage, Affordable Housing).

1.7 Vipingo Mixed Used Development Master Plan specifications/ facilities

The proposals as put up by a team of consultants such as project planners, project managers, urban planners, engineers, quantity surveyors, environmentalists, physical planners, hydro geologists and other ancillary consultants as the need be to come up with the most economically viable, environmentally sound, technologically savvy mixed-use dwellings as envisaged by the client. The proposed components will be put up in such a manner to maximize the intended benefits.

The intended Vipingo master plan will comprise of several spatial land use patterns, which will include 28% residential, 20% industrial, 15% commercial, 4% on sisal and 3% education. Others will consist of utilities and open space. The following provides details of the proposed facilities:

- Controlled mixed-use development that is governed by a development control code and rules.
- Security that integrates both physical and technology to provide advanced security surveillance systems that include non-controlled ingress and egress both into the city and individual buildings.
- Due to limited water resources, a water company shall be established to manage collection, production, distribution and reclamation of water within the development.
- Provide reliable power distribution with minimal brown outs, back-up generators and provide up to 30% of the development power demand from renewable energy sources.
- Provision on 24 hours medical and emergency facilities to be incorporated in the development plan, this includes ambulance and fire brigades
- Provision of a zone for the development of health care city and research centre within the development
- Allocation of a zone for the development of universities, primary and tertiary education facilities
- An adequate traffic design that ensures a walkable environment that is not hampered by vehicular traffic
- To ensure that Vipingo Mixed-use development is anchored on sustainability and green initiatives
- To innovate asset and facility management that will maintain the built up environment

The zones in each of the development phases include:

- Residential Zone
- Office and Commercial Zone
- Industrial Zone
- Hospitality Zone
- Institutional zone
- Recreational and sport activities zones
- Support trunk infrastructure

- Parks and Agricultural Pockets

1.8 Methodology and Criteria for undertaking the SEA

The SEA was carried out in line with the provisions of the Environmental Management and Coordination Act, (EMCA, Cap 387), the Environmental (Impact Assessment and Audit) Regulations 2003 and its subsequent amendments, Draft Environmental Management and Coordination (Strategic Assessment, Integrated Impact Assessment and Audit) Regulations 2018, the 2012 National Guidelines for Strategic Environmental Assessment in Kenya, as well as international guidelines on SEA.

Generally, the SEA process was phased into two:

- **Phase 1 – Screening and Scoping.** The Screening and Scoping Phase was aimed at establishing the spatial and technical focus and content of the SEA and the relevant criteria for assessment.
- **Phase 2 Vipingo Mixed-use Development SEA Study**. The purpose of the SEA is to identify, describe and assess at a strategic level the environmental and socio-economic opportunities and constraints of implementing the proposed Master Plan. Further, the process developed practical mitigation measures for addressing the identified limitations as well as the enhancement of opportunities.

The SEA is intended to ensure that environmental and social considerations are included in the planning, implementation, and operation phases of the proposed Master Plan. The main activities in this SEA study include:

i. Description of the proposed Master Plan including the objective, purpose, and rationale;
ii. Identification of alternative options and strategies, implementation plan and time scale;
iii. Areas and sectors affected by the proposed Plan;
iv. Field missions for baseline environmental analysis;
v. Collection of baseline data including data on ecological processes and services, resilience and vulnerability of these processes and their significance to human well-being;
vi. Review and analysis of existing policy and legislative frameworks for environmental protection and existing environmental protection programs and their objectives;
vii. Review of all relevant development plans for the area within the study boundaries;
viii. Identification of alternatives options and justification of preferred alternatives and linkages between on-going projects and proposed plan;
ix. Integration of climate change vulnerability assessment, adaptation and mitigation actions;
x. Prediction and evaluation of impacts, including cumulative effects;
xi. Preparation of Environmental and Social Management and Monitoring Plans (ESMMPs);
xii. Institutional Strengthening/ Capacity Building;
xiii. Identification of gaps and alternatives actions;
xiv. Stakeholder consultations and public participation;
xv. Presentation of findings and stakeholder dialogue;
xvi. Compilation, validation and submission of final SEA report;

1.8.1 Key Stages in the SEA preparation

The following table summarizes the key stages in the SEA preparation;

Table 1-1 SEA Actions and Decisions

STAGE 1: ESTABLISHING THE CONTEXT

Screening:

- A brief of the Master Plan is submitted to NEMA by the client's approved SEA Expert,
- NEMA screens the Master Plan to determine whether a SEA is required; the screening results are communicated to the Master Plan owner (Client) within 7 working days.

Establishing the context to conduct the SEA and other preparatory tasks:

- Understanding the Master Plan;
- Other preparatory tasks - constituting the SEA team.

STAGE 2: IMPLEMENTING THE SEA

Scoping:

- NEMA advises the Master Plan owner (Client) to select licensed SEA experts.
- The licensed SEA experts prepare the scoping report.
- The Master Plan owner submits three (3) copies of the scoping report to NEMA.
- NEMA reviews the adequacy of the scoping report.
- NEMA communicates the decision to approve the scoping report or to request more information to the Master Plan owner within 21 days.

Detailed SEA Study and Draft SEA Report:

- Once the scoping report is approved, the SEA experts conduct the SEA process and prepare the draft SEA report. The Master Plan owner or SEA team leader should subject the Draft SEA to a quality-assurance procedure before it is submitted to NEMA.
- Along with the prescribed fees, the Master Plan owner submits to NEMA at least ten (10) hard copies and one (1) electronic copy of the Draft SEA Report (which includes a non-technical summary and a Submission Form)

STAGE 3: INFORMING AND INFLUENCING DECISION-MAKING

Review:

Administrative Review:

- NEMA shall within 14 days of the receipt of the report conduct an Administrative Review of the Draft Report to ensure that the Draft SEA is adequate to enter the stakeholder-review process.
- Once the draft report passes the Administrative Review, NEMA distributes the Draft SEA Report to stakeholders for comments.

Stakeholder Reviews:

- NEMA sends the draft SEA report to relevant stakeholders. Stakeholders generally have 30 working days (from the date of dispatch) to submit comments on a Plan or Program-level SEA, and 45 working days to comment on a Policy-level SEA. NEMA may extend this review period in some instances.

Public Review:

- A *notice* regarding the draft SEA is published for 2 successive weeks in both the Kenya Gazette and a newspaper with a nationwide circulation. The public generally has working 30 days (from the date of the first advertisement) to submit comments on a Plan or Program, and 45 working days to comment on a Policy-level SEA.

Committee Review(s):

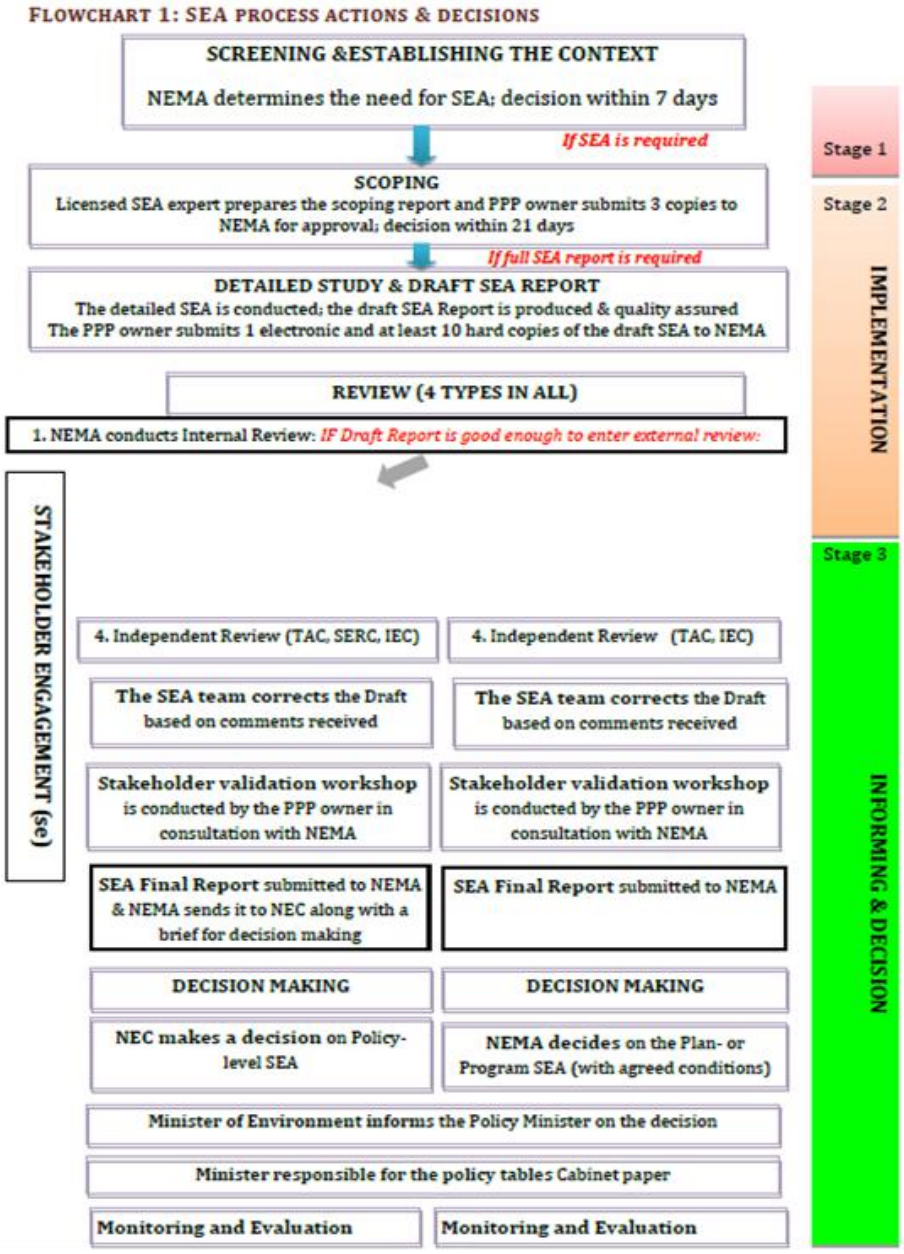
- NEMA *may* constitute a Technical Advisory Committee (TAC) to review and provide independent technical comments on a Plan or Program-level SEA. The Standards and Enforcement Review Committee (SERC) *may* be asked to review Policy-level SEAs. Committee reviews will be done within a period of 60 days. An Independent Expert Commission *will be setup* to review SEAs having trans-boundary impacts.

Validation, Preparation and Submission of Final SEA Report: • The SEA experts incorporate stakeholder comments into the Draft SEA Report; • To maintain validity of the SEA, the SEA team should bring the corrected version of the SEA within sixty (60) days. • In coordination with NEMA, the Master Plan owner will hold a validation workshop to engage the public/ stakeholders in reviewing and validating the *corrected* SEA report. • NEMA will coordinate the additional corrections arising from the validation workshop to finalize the SEA report. • The Master Plan owner submits five (5) hard copies and one (1) electronic copy of the Final SEA Report to NEMA. Decision Making for Plan or Program-level SEA • NEMA will make the final decision for Plan and Program-level SEAs through issuing an approval with conditions. The decision will be communicated within 60 days. • The Master Plan owner needs to consent in writing to the approval conditions before implementing the plan or program
STAGE 4: MONITORING AND EVALUATION • The Master Plan owner is responsible for monitoring and evaluation of the Master Plan. • NEMA shall oversee the M&E process by the Master Plan owner. • SERC shall follow-up with NEMA on the M&E of the Policy.

***Source**: NEMA SEA Guidelines 2012*

Summary of the SEA process

The flow chart below summarises the processes undertaken during the Strategic Environmental Asessment (SEA) process.



Source: *NEMA SEA Guidelines 2012*

Figure 1-1 SEA Process

1.9 Work Plan and Deliverables for executing the SEA

1.9.1 SEA Time Schedule

The entire Strategic Environmental Assessment, starting from data collection to submission of the Final SEA Report to NEMA and approval, was undertaken as per EMCA Cap 387 and SEA Guidelines of 2012. Table 1:2 below presents a summary of the key activities that were followed. Table 1:3 summarizes the milestones and the key deliverables.

Table 1-2 SEA Time Schedule

Report Due/Activities	weeks				
	1-40	50-80	90-120	130-120	
Task 1: Mobilization period / SEA Screening and Scoping/ Development of data collection tools/TORs-Drafting of Master Plan Brief for NEMA Approval					
Task 2: Detailed Description of the Proposed Master Plan					
Task 3: Detailed Description of the Environment/ Baseline Surveys					
Task 4: Analysis of the Legislative and regulatory Considerations					
Task 5: Determination of the Potential Impacts of the Proposed Master Plan					
Task 6: Analysis of the Alternatives to the Proposed Master Plan					
Task 7: Development of Environmental Management Plan to Mitigate Negative Impacts/Concerns					
Task 8: Development of Environmental Monitoring Plan					
Task 9: Identification of Institutional Needs to Implement SEA Recommendations					
Task 10: Public Consultations and Public Participation					
Task 11: Final SEA Report Compilation, Review and Final Submission to Proponent/ Developer and NEMA					
Task 12: Processing and Approval of Final SEA Report					
Approvals = Within 120 weeks from the date of commencement					

Source: *Scoping SEA Report for Vipingo Development Limited*

1.9.2 Key deliverables for the SEA

The table below gives tentative timelines for the whole SEA process.

Table 1-3 Key deliverables for the SEA

SN	Milestones/ deliverables	Dates
1.	Master Plan Brief, Submission and Approval by NEMA	**12th January 2016**
2.	Data Collection and Submission of SEA Scoping Report to NEMA	**24th February 2016**
3.	Stakeholders meeting	**Continuous (2016 - 2021)**
4.	Submission of SEA Draft Report	**1/04/2021**
5.	SEA Validation Workshop	**17/05/2021**
6.	Drafting and submission of SEA Final Report	**28/05/2021**
7.	NEMA Approval Period	**27/08/2021**

Source: *AWEMAC*

1.9.3 Budget to implement the SEA

Vipingo Development Limited committed to facilitate financial, administrative, and technical resources to see the SEA process from scoping into implementation stage. The proponent also provided access to Master Plan details, various master plan information and obliged to facilitate consultative meetings among key SEA consultants, technical teams and stakeholders.

2 DESCRIPTION OF THE VIPINGO MIXED USE DEVELOPMENT MASTER PLAN

2.1 Introduction

A sustainable development has to incorporate socio-economic and environment-friendly concepts/ principles by hosting a community of integrated mixed-use development including housing, businesses, industrial etc. seeking to enhance environmental and economic performance through collaboration in managing environmental and resource issues, including energy, water and materials. Consequently, the proposed Master Plan has integrated all the facets of a sustainably developed entity by ensuring that the economic, social and environmental factors are its guiding principles in the design, construction and management.

This chapter highlights the purpose, rationale, and objectives, of Vipingo Mixed Use Development Master Plan. It also identified and discusses sectors affected and that interlink with the Master Plan

2.2 Purpose / Rationale of Vipingo Mixed Use Development Master plan

The rationale for Vipingo Mixed Use Development Master Plan is to develop a sustainable development that incorporates socio-economic and environment-friendly concepts/principles by hosting a community of integrated mixed-use development. The Master Plan proposes a comprehensive mix of land uses seeking to pursue a balance among economic, social, and environmental performance during plan implementation.

2.3 Objectives of the Vipingo Mixed Use Development Master plan

The proposed Vipingo Mixed Use Development Master plan aims to safeguard integration of all the facets of a sustainably developed entity by ensuring that the economic, social and environmental factors are its guiding principles in the design, construction and management. The specific objectives of the plan are to provide the much-needed facilities and services as highlighted below:

- To establish controlled mixed-use development that is governed by a development control code and rules.
- To provide security that integrates both physical and technology to provide advanced security surveillance systems that include non-controlled ingress and egress both into the development and individual buildings.
- To ensure responsible collection, production, distribution, and reclamation of water resources within the development.
- To provide reliable power distribution with minimal brown outs, back-up generators and provide up to 30% of the development power demand from renewable energy sources.
- To provide 24 hours medical and emergency facilities to be incorporated in the development plan these include ambulance and fire brigades
- To provide zone for the development of health care city and research centre within the development
- To allocate a zone for the development of universities, primary and tertiary education facilities
- To establish an adequate traffic design that ensures a walkable environment that is not hampered by vehicular traffic
- To ensure that Vipingo Mixed-use development is anchored on sustainability and green initiatives
- To innovate asset and facility management that will maintain the built up environment

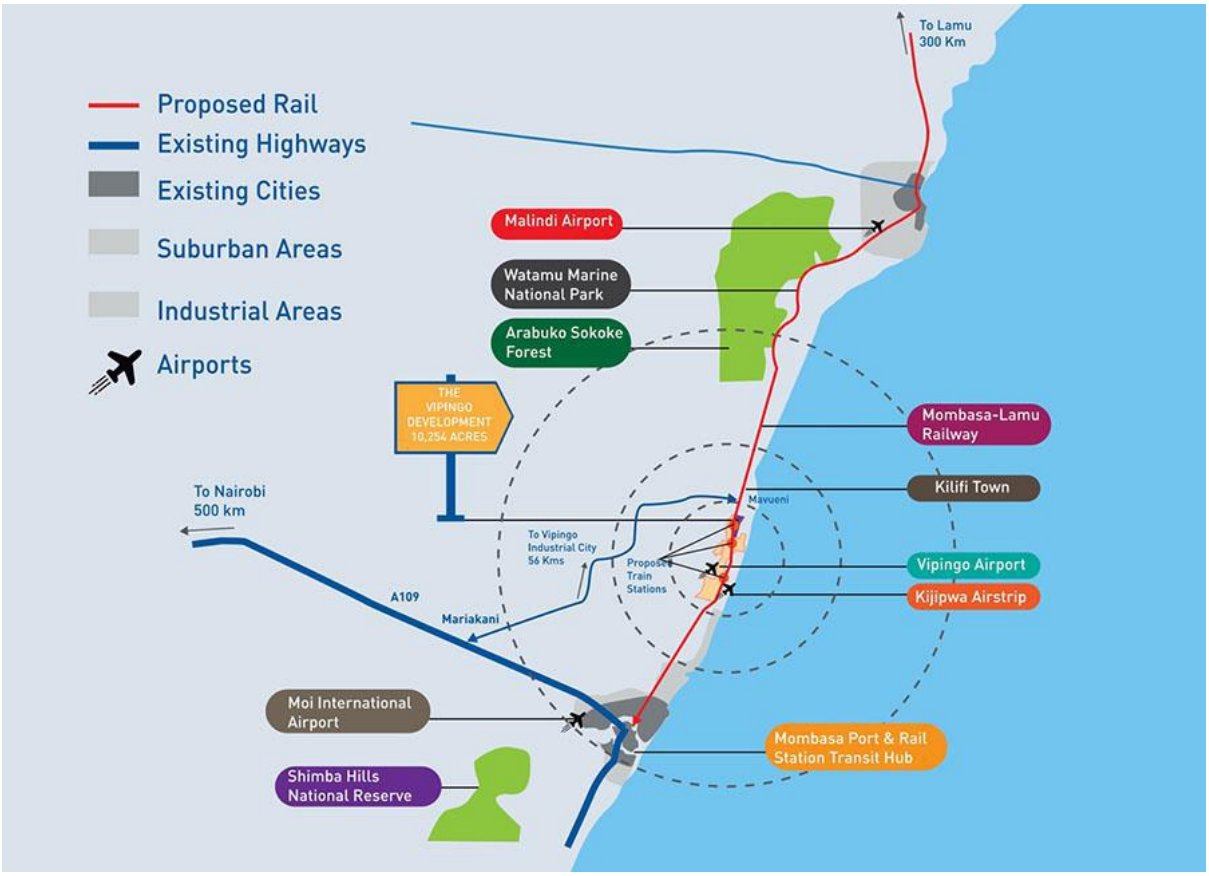
2.4 Definition of the Boundaries

Vipingo Development Limited, a wholly owned subsidiary of Centum Investment Company Limited intends to develop a master plan on the 10,254 Acres of land supported by the following

basic facilities: controlled mixed-use development, security, water, power, emergency services, health facilities, education facilities, walkability & parking, sustainability and urban management. The development will be carried out in several phases.

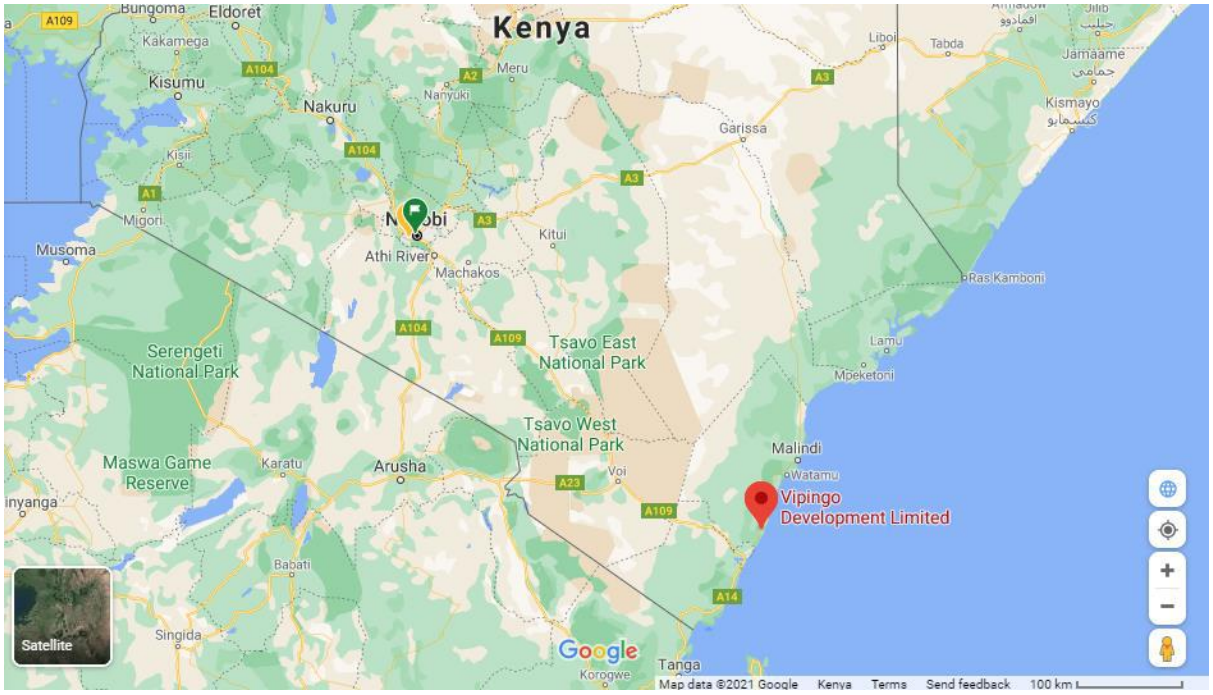
The proposed development site is strategically located along the Kenyan Coast, which is a global tourist destination. It is located along the Mombasa– Lamu Highway and in close proximity to Mombasa Mixed use development, which houses the main Kilindini Port, a gateway to Kenya, Uganda, Rwanda, and Burundi. The development site is also connected through Moi International Airport in Mombasa, Malindi Airport and Proposed Vipingo Mixed Use Development Air Strip. The main Mombasa-Lamu road eventually links up with the LAPSSET corridor in Lamu. It is also in close proximity to the proposed Government Mariakani Logistics Hub.

The proposed development shall be located between Mtwapa and Kilifi towns in Kilifi County at the Kenyan coast and it is proximate to Mombasa County (as seen in Figures below). Vipingo is the most prominent growth spine along Mombasa-Malindi highway. To the North, the development borders Takaungu market center while to the North East, near the sea front, it borders Mombasa Cement. From this point moving southwards, the development borders Shariani, Kuruwitu, Vipingo and Kijipwa Villages. To the western side, the development borders Timboni trading center, Kadzinuni, Kapeche, Mkomani and Vipingo Ridge Golf Course and Residential Development. The proposed site can be accessed from Mombasa –Malindi Highway between Mtwapa and Kilifi Towns.



Source: Vipingo Development Website

Figure 2-1: Location of the proposed development



Source: *Google Maps*

Figure 2-2: Google Map Site location for the proposed mixed-use development

2.5 Existing Land Uses and Surrounding Development

The proposed development area is a sisal plantation with concentration of existing developments located partially to the Southern, Central and Western parts of the area. The existing development on the Southern part of the area is composed of REA Proposed Vipingo Mixed Use Development Plantation Limited offices and labourers' houses. On the Central part of the land zone is Kibaoni market centre with mixed use activities taking place. To the West are settlements that are occupied by the sisal workers and major production activities of the sisal farm take place as well. There are also schools and Health centres and a cemetery serving the settlements. Two sisal processing factories are located within the development area. Other public facilities located within the Southern part of the area demarcated for development are Kijipwa police station. Development and features directly adjacent to the land zone include:

- The Indian Ocean to the East.
- Proposed Vipingo Mixed Use Development Ridge which is a high-income residential area to the west of the property;
- A vast Mazrui land and Takaungu settlement to the North;
- Mombasa Cement Factory to the North East;
- Kikambala formal settlement to the South West

Although the site is predominantly agriculture in character, there are also added neighbouring market centres with land uses such as commercial, educational facilities and public purpose facilities. The key towns, located along the coast where the site is located, include Malindi, Kilifi, Mtwapa, and Mombasa.

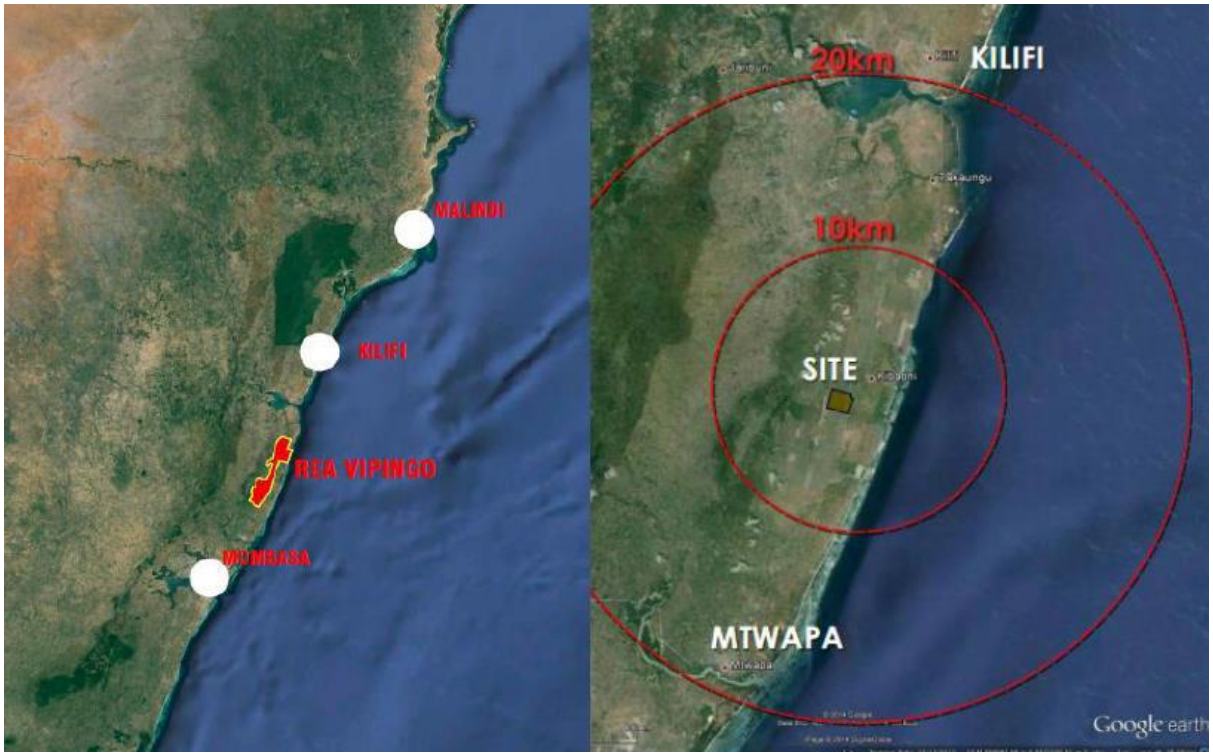


Figure 2-3 The Surrounding Area

Source: Vipingo Development Change of Use report 2016

2.6 Key Components of the full Proposed Master Plan

Vipingo Development Limited intends to develop a master plan Mixed-use Development on the 10,254 acres land comprising of different zones (figure 2-4). The implementation of the Vipingo Mixed Use Development Master Plan will be done in phases over a period of 20 to 30 years. Key land uses include: residential zone (include high, medium and low density; affordable and social housing); commercial zone (retail and office); industrial zone (industrial park for light to heavy industry; warehousing facilities), hospitality zone (3- and 5-star hotels and resorts; mice facility), institutional zone (healthcare facilities; educational facilities; religious centres) and recreational (entertainment facilities; sporting facilities; nature trails etc. and sport activities zones). Table 2-2 gives a highlight of the full spatial land use patterns anticipated in the development.

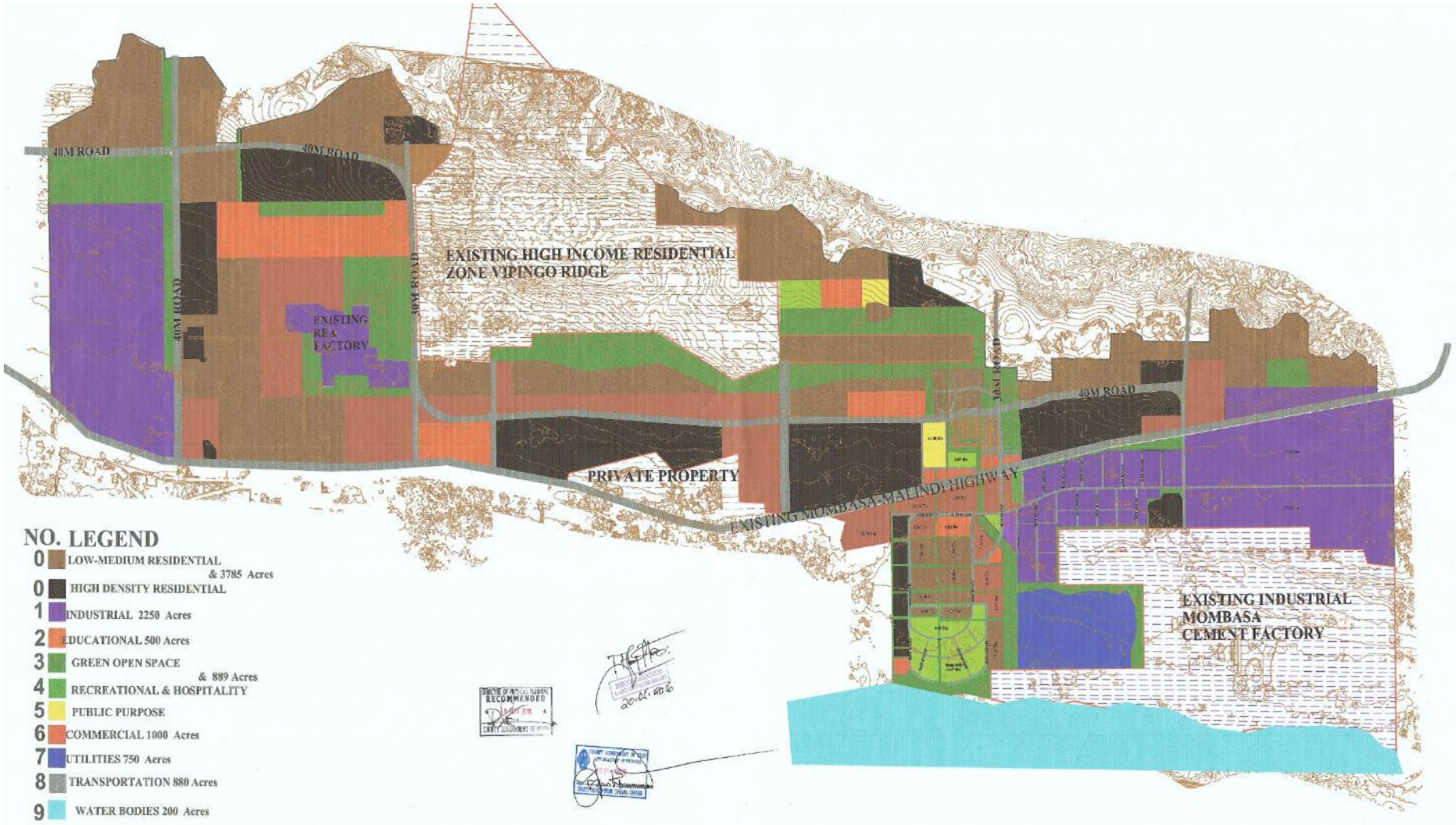


Figure 2-4: A master plan identifying different land uses in Vipingo Mixed-use Development
(Source: Vipingo Development Limited, 2016)

Table 2-1 Proposed full land use patterns for Vipingo Mixed Use Development Master Plan

Land use	Size in Acres	Percentage
Industrial	2,250	22%
Residential	3,785	37%
Commercial	1000	10%
Institutional (University, school, hospital)	500	5%
Open space	889	9%
Water bodies	200	2%
Utilities	750	7%
Transportation	880	9%
Total	**10,254**	**100%**

Source: *Vipingo Development Change of Use Report -2016*

2.6.1 Industrial Zone

The industrial zone will cover 2,250 acres, which is 22% of the land and will have distribution warehouses and an industrial park that includes light and heavy industries such as:

- Metal and allied - integrated steel mill, Cold Rolled Coils and Sheets, galvanized wire, Aluminium Products, among others
- Technology park; Energy, Electricals and Electronics, Automatic Voltage Switches, among others
- Agro industries -Dairy Products, Storage of Grain, coconut, and mango processing, among others
- Apparel and textile -Garment Manufacturing for Export, Clothing, Textile and Knit Wear, among others
- FMCG - Bottled Drinking Water, Bar Soap, Tea, Confectioneries, Biscuits, juices & soda,
- Pharmaceuticals – packing and storage
- Plastics & rubber –Permitted Polythene Bags, Paper and Board, cartons, Permitted Poly Propylene Bags, footwear

The zone is expected to utilize 85,020,000 litres of water per day and produce 76,518,000 litres of wastewater per day. In addition, 1,301,600 Kgs of solid waste will be produced per day. An estimated 50,542KW of electricity will be consumed by the zone on daily basis.

2.6.2 Residential Zone

The residential area will have low, medium, and high density of people. The residential area target market includes both middle income earners and high-end earners. Approximately 3,785 acres of land will be utilized for this zone, which comes to about 37% of total land area. It is anticipated that approximately 200,000 - 250,000 residents will occupy the development area.

2.6.3 Commercial Zone

The zone will occupy approximately 1000 acres (10%).

This zone has various facilities that include the shopping arcade that is convenient for shopping, office parks providing various offices, show rooms and retail malls. The commercial zone will be mixed use including offices and hospitality zone.

The hospitality zone will host a 5 star and a 3-star hotel and resort together with meetings, incentives, conferences and exhibitions (MICE) facilities. It will also include entertainment facilities such as amusement parks among others.

2.6.4 Institutional zone (University, school, hospital)

This zone will occupy approximately 500 acres (5%) with various facilities including hospital (both private and public), clinics and dispensaries, universities, sports academies and stadium, church, mosques and schools (Nursery schools, primary, high schools and Universities). The educational facilities will occupy 300 acres (3%) of land; a total of 10,000 university students and 87,500 primary and secondary students are expected.

- Primary school – currently there over 3 public primary school that will continue with providing education
- Primary school – One international day and boarding school with a capacity of 1,700 students
- Secondary school – One international day and boarding school with a capacity of 1,000 students
- Universities – opportunity for existing universities to set up their satellite campuses in this location similar to what we have in Nairobi CBD, Mombasa and Kisumu – we have more than 10 universities in Nairobi CBD today and the number of universities will depend on market demand

These institutions are subject to increment in future with an increase in population

2.6.5 Open Spaces (Recreational and sport activities zones)

It is estimated that open spaces will occupy approximately 889 acres or 9% will be occupied by open space, of which 700 acres will be for active recreational parks.

A number of facilities providing sports and recreational activities will be developed including nature trails, water sports, spa, gym, tennis, cycling, swimming, basketball, mini-soccer pitch, kids play areas, yachting and outdoor landscape events areas. The sports stadium will have a seating capacity of approximately 5,000 – 7,000.

2.6.6 Water bodies

In addition, approximately 200 acres (2%) of total land will contain water bodies which will also be a host for recreational activities.

2.6.7 Support trunk infrastructure

Approximately 880 acres (9%) will be occupied by transportation infrastructure. Vipingo Mixed-use Development will have advanced infrastructure. This includes: road infrastructure, reliable power distribution network, abundant domestics and industrial water supplies, waste water collection network, treatments and recycling facilities, telecommunication facilities, firefighting facilities and beautifully landscaped open space for leisure.

2.6.8 Utilities

It is estimated that 750 acres (7%) will contain utilities such as electrical generation and distribution, solar fields, drinking water treatment plant, wastewater treatment plant and solid waste.

2.7 Phase 1 - Progress attained in Vipingo Mixed Use Development Master Plan implementation

Phase one is expected to occupy approximately 700 acres of land (Table 2-2). It is anticipated that it will host 20,000 people, excluding day time population, with 5,000 housing units ranging from low, medium and high density. Implementation of phase one (1) commenced in March 2016.

Table 2-2 Phase 1 Vipingo Development Masterplan Land Uses

Land use	**Size in Acres**	**Percentage of Total acres in Phase 1**
Industrial	310	44%
Residential	140	20%
Commercial	10	1%
Institutional (University, school, hospital)	40	6%
Open space	50	5%
Water bodies	10	1%
Utilities	90	13%
Transportation	50	7%
Total acreage to be developed in Phase 1	**700**	**100%**
Agriculture (sisal Plantation)	**9,554**	
Grand Total Implementation	**10,254**	

Source: *Vipingo Development Change of Use Report - 2016*

Source: Vipingo Development Change of Use Report - 2016

Figure 2-5 Phase 1 of Vipingo Master Plan Development

Table below highlights the infrastructure / development components for phase 1.

Table 2-3 Phase 1 Development components

Zones	Development components
Trunk infrastructure	▪ Road infrastructure ▪ Reliable power distribution network ▪ Abundant domestics and industrial water supply ▪ Waste water collection network, treatment and recycling facilities ▪ Telecommunication facilities ▪ Firefighting facilities ▪ Beautifully landscaped open space for leisure.
Residential	▪ Low density. ▪ Medium density
Commercial	▪ Shopping arcade - convenience shopping ▪ Gas station, ▪ convenience retail shops, shopping, retail kiosk, ATM, F&B, entertainment facilities
Industrial	▪ Industrial park ▪ Warehousing – storage and logistics facilities

Institutional (University, school, hospital)	▪ Hospital ▪ University ▪ Sports academy and stadium

Source: Vipingo Development Change of Use Report - 2016

The following Phase 1 projects are at various stages;

- Infrastructure Development **(completed)**
- Awali Estate – maisonettes and bungalows **(completed)**
- 1255 Palm Ridge – 440 affordable Apartments **(under construction)**
- Sea water desalination plant – 3 million liters per day **(commissioning stage)**
- Vipingo Leisure Centre- Shopping mall – 10,000 sq.m **(under construction)**

2.7.1 Infrastructure Development for Phase 1

Vipingo Development Limited undertook development of infrastructure components to support Phase I of the mixed-use development. Infrastructure development for Phase I of Vipingo Mixed Use development was anchored on providing the most cost-effective place to do business supported by high quality infrastructure, amenities, services, urban environment with access to skilled and non-skilled labour. The development of the infrastructure commenced in 2016 upon issuance of NEMA license Ref: *NEMA/EIA/PSL/3075*

The design for the infrastructure for Phase I provided for the construction of various components and associated works including

- Road works - road infrastructure, road furniture, foot paths, culverts & drainage
- Reliable power distribution network including electrical installations (street lighting) and duct works (electrical)
- Abundant domestics and industrial water supply
- Waste water collection network, treatment and recycling facilities
- Telecommunication facilities
- Firefighting facilities
- Landscaped open space for leisure.
- Water reticulation - Inclusive of Tanks and Pipework.

The provision of clean, safe and adequate water is a vital component for the health and economic development of any population. Owing to the increasing demand for water to meet increasing community population and the lack of adequate and reliable water, the Vipingo Development Ltd (VDL) drilled boreholes to meet the construction needs of the development and also water needs of local communities in Vipingo. Thus, as part of support for Phase 1 infrastructure; a total of 10 boreholes were developed following approval of EIA in year 2016 and issuance of NEMA License.

Table 2-4 List of boreholes

SITE ID	VES No.	Depth, m	Easting, m	Northing, m
BH 1	VES 1	40	591640	9585083
BH 2	VES	50	591715,	9586754
BH 3	VES 1	50	592169	9585339
BH 4	VES 1	60	591792	9587499
BH 5	VES 2	60	591686	9586493
BH 6	VES 1	60	592208	9586108
BH 7	VES 2	45	593295	9588955
BH 8	VES 1	60	591945	9589109
BH 9	VES 1	55	592559	9586397
BH 10	VES 3	50	591879	9587247

Source: EIA for proposed 10 boreholes in Vipingo, 2016

2.7.2 Awali Estate – maisonettes and bungalows (completed)

Awali Estate is a residential development comprising 152 units occupying 30 acres of land. The units consist of 90 bungalows and 62 maisonettes. Other key support facilities in the Awali Estate include sports and recreational facilities, swimming pool, kids play area, outdoor gym, gazebo, and associated amenities. The development of the residential estate commenced in 2018 upon issuance of NEMA license Ref*: NEMA/EIA/PSL/7154.*

The maisonettes have a total built-up area of 210sqm inclusive of all the terraces (ground and first), two bedrooms, a master bedroom on the first floor with an outside terrace, dining area, kitchen, laundry area; domestic servants' quarter (DSQ) and a carport for 2 cars. The bungalows have a total built up area of 155sqm that include a master bedroom, 2 bedrooms, dining area, kitchen, laundry area, DSQ, an outside terrace and a carport for 2 cars. The units are distributed in 4 zones as listed below;

Table 2-5 Table showing Awali Estate units and types

Zone	Type & number of units		Total units
	Bungalows	**Maisonettes**	
Zone A	20	15	35
Zone B	20	16	26
Zone C	22	19	41
Zone D	28	12	40
Total	**90**	**62**	**152**

Source: EIA for Awali Estate, 2018

Below plates highlight the completed Awali Estate.

Source: *AWEMAC Field Work 2020*

Plate 2-1 Entrance to Awali Estate

Source: *AWEMAC Field Work, 2020*

Plate 2-2 Completed Awali Estate bungalows and infrastructure amenities

2.7.3 1255 Palm Ridge – 440 affordable Apartments (under construction)

Palm Ridge development commenced in 2018 upon issuance of NEMA license *Ref: NEMA/EIA/PSL/7155*. The development is currently under construction with expected 1,255 apartments on 20 acres of land to be developed in various phases. Phase 1 of the Palm Ridge (currently under construction) will have 440 units with 100 – one-bedroom units, 160 – two-bedroom units and 180 – three-bedroom units.

Upon completion, the development will comprise of a mix of 1, 2 and 3-bedroom apartments. The 1-bedroom apartments will have a total built-up area of 45sqm that will be inclusive of a lounge, Bedroom, Kitchen, Laundry yard. The 2-bedroom apartments will have a total built-up area of 60sqm that will be inclusive of a lounge, 2 Bedrooms, Kitchen, Laundry yard. The 3-bedroom apartments will have a total built-up area of 75sqm that will be inclusive of a lounge, 3 Bedrooms with master ensuite, Kitchen and Laundry yard. The development will also be supported by the following facilities; paved roads, reliable power connection, constant potable water supply from Vipingo desalination plant, ample parking, beautifully landscaped parks, playgrounds, kindergarten, Closed-Circuit Television (CCTV) surveillance, perimeter fence and security patrols. The apartment design features are summarized in table 2-5 below;

Table 2-6 Specifications of the Ongoing Palm Ridge Apartment Units

One-bedroom	Two-bedroom	Three-bedroom
The one-bedroom apartment measures 45 Sqm comprising 125 one bedrooms with; ▪ A lounge, ▪ Bedroom ▪ Kitchen ▪ Laundry yard	The two-bedroom apartment measures 60 Sqm comprising 755 two-bedrooms with: ▪ A lounge, ▪ Two Bedrooms ▪ Kitchen ▪ Laundry yard	The three-bedroom apartment measures 75 sqm comprising 375 three bedrooms with: ▪ A lounge, ▪ Three bedrooms with ▪ master ensuite ▪ Kitchen ▪ • Laundry yard

Source: *EIA for Palm Ridge 2018*

Source: *AWEMAC Field Work 2020*

Plate 2-3 Phase 1 of Palm Ridge Apartment showing various blocks

Source: *AWEMAC Field Work 2020*

Plate 2-4 Overview of ongoing construction of Palm Ridge apartment

2.7.4 Sea water desalination plant – 3 million liters per day (commissioning stage)

The Sea water desalination plant commenced in 2018 upon issuance of NEMA license *Ref: NEMA Registration No. 0049978.* The plant lays on 5 acres of land and is expected to process 3 Million Litres of water per day. It aims to abstract saline water from wells to produce fresh water for domestic and industrial use. It is currently at the commissioning stage with installation complete and testing ongoing.

Source: *AWEMAC Field Work 2020*

Plate 2-5 The sea desalination Plant

Source: *AWEMAC Field Work 2020*

Plate 2-6 Water reservoir for the sea desalination plant

2.7.5 Vipingo Leisure Centre - shopping mall – 10,000 sq.m (under construction)

The shopping mall currently under development commenced in 2019 with issuance of NEMA license *Ref: NEMA/EIA/PSL/7986.* Upon completion, the development will occupy 10 acres and comprise of a supermarket, restaurant, banking services, medical facilities, gym, bar, play area, hotel, office building, car park, filling station and a car wash. The center will have a total retail gross leasable area (GLA) of 6567 square metres (sqm) and office space GLA of 2130 sqm. The lower level of retail includes a supermarket anchor, a sub-anchor, and a restaurant piazza with outdoor play area. Total retail GLA for the lower-level plan is 4352 m^2. An upper level of retail will be created to include; a gym, some banking facilities, service and medical facilities, and an upper-level bar. An office building is also positioned from first to third floor. The total retail GLA for the upper level will be 2215m^2. Offices will take up approximately 2130m^2 of GLA.

Development of the proposed commercial center including a filling station has been scheduled to take place in phases. Phase 1 will comprise of a retail centre, office space and a filling station. Phase 1 retail and office facility will be set on 3 acres to allow for scale and expansion. The petrol station will be on 1 acre. The petrol station will also provide truck stop for trucks ferrying goods between Mombasa and Nairobi. To differentiate the centre, it will have:

- Unique mix of retailers local and international especially food and beverage (F&B).
- Beautifully landscaped environment including water features.
- Properly planned accessibility, circulation, traffic management and parking.
- Differentiated by a variety of F&B and entertainment outlets

Source: *AWEMAC Field Work 2020*
Plate 2-7 Ongoing construction of the shopping mall

Source: *AWEMAC Field Work 2020*
Plate 2-8 Overview of the ongoing construction of the shopping mall / commercial centre

2.8 Identification of applicable sectors and plans

The proposed Vipingo Mixed-use Development is anticipated to interlink with other regional and local policies, plans and programmes. It will provide high quality of life; environmental sustainability and competitive economics that will make the development compete economically and commercially with other cities in the world as the business and residential location of choice. The project will be supported by high quality reliable, cost effective and sustainable state of the art infrastructure. The proposed master plan ties/links very well with other related plans at:

- National Level - Kenya
- Regional Level (Coast Region) and,
- County Level (Kilifi County).

The subsection below briefly outlines the linkages.

2.8.1 Linkage at National Level

2.8.1.1 Vision 2030

Nationally, the proposed Vipingo Mixed Use Development Master Plan links well with Vision 2030 blueprint. Chapter 3 of the Vision 2030 talks about the economic vision and strategy: adding value to our products and services. Key in the economic vision is the tourism sector. According to Vision 2030, Kenya aims to be among the top 10 long-haul tourist destinations in the world offering a high-end, diverse and distinctive visitor experience that few of her competitors can offer. In the blue print, three specific goals were set for 2012:

- Quadruple tourism's GDP contribution to more than Ksh. 200 billion
- Raise international visitors from 1.6 million in 2006 to 3 million in 2012 while raising average spent per visitor from the present Ksh. 40,000 to at least Ksh. 70,000
- Increase hotel beds from 40,000 to at least 65,000, combined with an emphasis on a high quality services

The flagship tourism projects in the vision 2030 include:

- ✓ Three (3) resort cities – two new resorts cities at the coast (one in the north and the other at the south coast). The third one will be located in Isiolo
- ✓ Better marketing of little-visited parks to bring more tourists to game parks that have previously not been receiving many visitors that are located in all parts of the country etc.

Chapter 4 talks about the Social Pillar; investing in the people of Kenya. Kenya's journey towards prosperity also involves the building of a just and cohesive society, enjoying equitable social development in a clean and secure environment. This quest is the basis of transformation in eight key social sectors; Education and Training; Health; Water and Sanitation; the Environment; Housing and Urbanisation; as well as in Gender, Youth Sports and Culture, equity and poverty reduction. It also makes special provisions for Kenyans with various disabilities and previously marginalized communities. These policies (and those in the economic pillar) will be founded on all-round adoption of Science, Technology and Innovation (STI) as an implementation tool.

The Vipingo Mixed Use Development Master Plan proposes a model resort city with hospitality industry featuring prominently. The proposed master plan also features learning institutions, health facilities, improved infrastructure and provision of amenities, sports stadia and housing developments. As such, implementation of the Vipingo master plan will contribute immensely towards the achievement of key flagship vision 2030 projects not only in tourism sector but also in agriculture, education, water & sanitation, housing, industry amongst others.

2.8.1.2 The Government of Kenya's Big Four Agenda (GoK, 2018)

The National government came up with the Big Four agenda with four pillars: manufacturing, universal healthcare, affordable housing, and food security. This is fully supported by President Uhuru Kenyatta in a bid to cement his legacy. The government allocated Sh44.6 billion for universal health coverage, Sh6.5 billion for provision of affordable and decent housing for all Kenyans, Sh20.25 billion to enhance food and nutrition security to all Kenyans by 2022, and Sh2.4 billion to support value addition and raise the manufacturing sector's share to gross domestic product to 15 per cent by 2022. To make the Big Four Agenda a success, the government plans to create partnerships with the private sector and development partners with the final goal of accelerating economic growth of the country through achievement of the four pillars.

Vipingo Mixed Use Development Master Plan offers a direct linkage to the Big Four Agenda as it provides adequate land for high end residential premises. This provision links very well with the goals and objectives of the Big Four Agenda for provision of affordable housing by investing in the housing sector. In enhancing the manufacturing sector, the government is proposing to promote industries like leather, textile and agro-processing. Similarly, Vipingo Mixed Use Development Master Plan, lays out substantial land for development of special economic zones, SME and industrial parks. As such, the proposed Vipingo Mixed Use Development contributes greatly to the government's Big Four Agenda on manufacturing.

2.8.1.3 The Big Four Tourism Plan 2030

The Big Four Tourism Plan 2030 was created by the Ministry of tourism to review its marketing strategy in a bid to upscale the tourism sector and reclaim Kenya's position as a leader in the sector. The blueprint provides strategies that aim at ensuring that the country's tourism sector unlocks its maximum potential. The plan calls for innovative approaches in the management of the tourism sector in Kenya to achieve Vision 2030, while outlining the tools and guidelines to achieve this. It is anchored on four pillars that include: product strategy, marketing strategy, investment promotion and infrastructure strategy.

To achieve this, the plan aims at capitalizing on Kenya's rich biodiversity by protecting indigenous animals, plants, habitats and ecosystems, and maintaining its purity for future generations while at the same time minimizing challenges that face wildlife and habitats such as climate change, population growth, pollution, poaching and human wildlife conflict. The Plan acts as a transformational framework for the tourism sector in Kenya offering modern approaches to tourism with vibrant, innovative and inclusive propositions that seek to provide unforgettable experiences to visitors, as well as ensure that tourism resources in the country benefit Kenyan communities.

The proposed Vipingo Mixed Use Development Master Plan consists of a comprehensive mix of land uses including residential zone, office and commercial zone, industrial zone, hospitality zone, institutional zone, recreational and sport activities zones, support trunk infrastructure, parks and agricultural pockets which will be privately managed. This means that it will be able to attract both domestic and international tourists who will be eager to enjoy the facilities and biodiversity of the proposed development. The proposed Master Plan also focuses on hospitality as it has set aside substantial land zone for tourism relate activities including recreational and sport activities zones. Similarly, The Big Four Tourism Plan 2030 advocates for infrastructure strategy and product promotion. The proposed mixed-use development activities are consistent with The Big Four Tourism Plan 2030 and are geared towards promoting tourism in the Coastal region.

2.8.1.4 National Biodiversity Strategy and Action Plan, 2000(GoK, 2000)

The National Biodiversity Strategy and Action Plan (NBSAP) was formulated to enable Kenya address national and international commitments defined in Article 6 of the Convention on Biological Diversity. The strategy is a national framework of action for ensuring that the present rate of biodiversity loss is reversed, and present levels of biological resources are maintained at sustainable levels for posterity. The general objectives of the strategy are to conserve Kenya's biodiversity; to sustainably use its components; to fairly and equitably share the benefits arising from the utilization of biological resources among the stakeholders; and to enhance technical and scientific cooperation nationally and internationally, including the exchange of information in support of biological conservation. The proposed Master Plan will need to comply with the requirements of this strategy since the land uses may interfere with biodiversity in some sections along the wetlands.

Vipingo Mixed Use Development Master plan has made provisions to ensure a clean and healthy environment through the environmental and social management plan. This will ensure protection of the biodiversity. It is also anticipated that Vipingo Development Authority will be guided by the Kenya National Biodiversity Strategy and Action Plan, considering environmental protection and conservation. The proposed mixed-use development has the potential of impacting on biodiversity including wetlands, forests resources and other natural environment. It is crucial to take appropriate measures to minimize interference and maximize conservation and proper utilization of biodiversity within the development area.

2.8.1.5 Agricultural Sector Development Strategy 2010-2020 (GoK, 2010)

Agricultural Sector Development Strategy 2010-2020 is the overall national policy document that guides all agricultural stakeholders and ministries in Kenya. It outlines the characteristics, challenges, opportunities, vision, mission, strategic thrusts, and the various interventions that the ministries will undertake to propel the agricultural sector to the future. The policy document advocates for improved management of the environment and natural resources, improved environmental conservation and improved pollution and waste management. The proposed Vipingo Mixed Use Development Master Plan should ensure sustainable management of riparian reserves, wildlife, and establishment of green belts in the development. The Master Plan has designated areas for agricultural zones to promote agricultural practices.

2.8.1.6 National Water Master Plan 2030(GoK, 2013)

The National Water Master Plan (NWMP) 2030 was launched on 26th March 2014. It is a product of an intensive study of Kenya's water resources and meteorological conditions to facilitate planning for development and management of the same. The objectives of the Project were: To assess and evaluate availability, reliability, quality, and vulnerability of the country's water resources up to around 2050 taking into consideration climate change; To renew the National Water Master Plan towards the year 2030 taking into consideration climate change; To formulate an action plan for activities of Water Resources Authority (WRA) up to 2022 to strengthen their capability; To strengthen the capacity of water resources management through transfer of technology.

NWMP 2030 has been prepared for six catchment areas which are management units of WRA. These include; Athi Catchment Area (ACA) – Machakos; Ewaso Ng'iro North Catchment Area (ENNCA) – Nanyuki; Lake Victoria North Catchment Area (LVNCA) – Kakamega; Lake Victoria South Catchment Area (LVSCA); Rift Valley Catchment Area (RVCA) – Nakuru and Tana Catchment Area (TCA) – Embu. The NWMP 2030 consist of the following nine component plans: a) Water Supply Development Plan; b) Sanitation Development Plan; c) Irrigation Development Plan; d) Hydropower Development Plan; e) Water Resources Development Plan; f) Water Resources Management Plan; g) Flood and Drought Disaster Management Plan and h) Environmental Management Plan.

The proposed Vipingo Mixed Use Development Master Plan fits within the Athi Catchment Areas hence will require being in line with the development plans and overall NWMP. The Master Plan aims at ensuring protection of water resources within the Master Plan area and management of water including proper rainwater harvesting and creating buffer zones for protection of water bodies. Vipingo Development Limited should input all strategies necessary to ensure adequate provision of water to its residents.

2.8.1.7 The National Spatial Plan (NSP) Framework

Kenya under vision 2030 has developed a thirty year (2015-2045) spatial plan that aims at distributing the population and activities on the national space for sustainable social-economic

development. The plan envisages optimal productivity, sustainability, efficiency and equitability in the use of the scarce land in Kenya and the territorial space. Further, the plan seeks to link human activities within the country's space through integrated planning, giving spatial dimension to various national economic sector policies for guaranteed optimal utilization of the available resources as outlined in Vision 2030 blue print. The national spatial plan provide a framework for urban development planning and management. Vipingo Mixed Use Master Plan also outlines strategies and policies for optimal and sustainable utilization of natural resource for agricultural production, and creating niches for tourism, renewable energy and water sources.

2.8.1.8 The Lamu Port South Sudan Ethiopia Transport (LAPSSET) Corridor

LAPSSET is a regional project between the countries of Ethiopia, Kenya and South Sudan with an aim of linking them to each other, and to their neighbors in Eastern Africa. The strategic objectives for LAPSSET include; improvement in Socio economic development in Kenya and the region; and to attract increased private sector investment in infrastructure development and management in the country. Information obtained from LAPSSET (2021) notes that the mega project consists of seven (7) key infrastructure projects including;

i. A new 32 Berth port at Lamu (Kenya);
ii. Interregional Highways from Lamu to Isiolo, Isiolo to Juba (South Sudan), Isiolo to Addis Ababa (Ethiopia), and Lamu to Garsen (Kenya), Crude Oil Pipeline from Lamu to Isiolo, Isiolo to Juba;
iii. Product Oil Pipeline from Lamu to Isiolo, Isiolo to Addis Ababa;
iv. Interregional Standard Gauge Railway (SGR) lines from Lamu to Isiolo, Isiolo to Juba, Isiolo to Addis Ababa, and Nairobi to Isiolo;
v. International Airports: one each at Lamu, Isiolo, and Lake Turkana;
vi. Resort Cities: one each at Lamu, Isiolo and Lake Turkana; and
vii. The multipurpose High Grand Falls Dam along the Tana River.

Notably, the LAPSSET Corridor Program is part of the Kenya Vision 2030 Strategy which is the national long-term development policy that aims to transform Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030 in a clean and secure environment. The proposed Vipingo Development Limited lies at a major trunk road (Mombasa-Lamu road) which will eventually link up with the LAPSSET corridor in Lamu. The planned upgrade of the Mombasa-Malindi -Lamu road to a superhighway will not only ease transportation but also enhance economic development within Malindi, Kilifi, Vipingo and surrounding areas. In addition, Vipingo Development is approximately 300 kilometers from Lamu. LAPSSET is also in close proximity to both Malindi and Kilifi, which are the biggest towns nearest to Lamu, hence definite social, and economic benefits are expected to be reaped by both Vipingo Development Limited and LAPSSET. The proposed interregional road network, including SGR and international airports provides ease of access from Vipingo Development to Ethiopia and South Sudan. Major transport boost is also expected for Vipingo Development Limited based on the East African Railways Master Plan (2009) envisioning an SGR line connection between Mombasa to Lamu Port.

2.8.2 Linkage at Coast Regional Level

2.8.2.1 Master Plan on Logistics in Northern Economic Corridor

At the coastal region level, the proposed Vipingo master plan links well with a similar master plan on logistics in Northern economic corridor. In this master plan, Mariakani has been proposed as one of the logistic hub. The proposed Vipingo mixed-use development lies approximately 40km from the Mariakani logistic hub. The Northern Economic Corridor master plan is characterized by high-level infrastructure (Roads, SGR, Pipelines), industrial parks amongst others. Similar

high-level infrastructures to support the mixed-use development have been proposed in the Vipingo master plan.

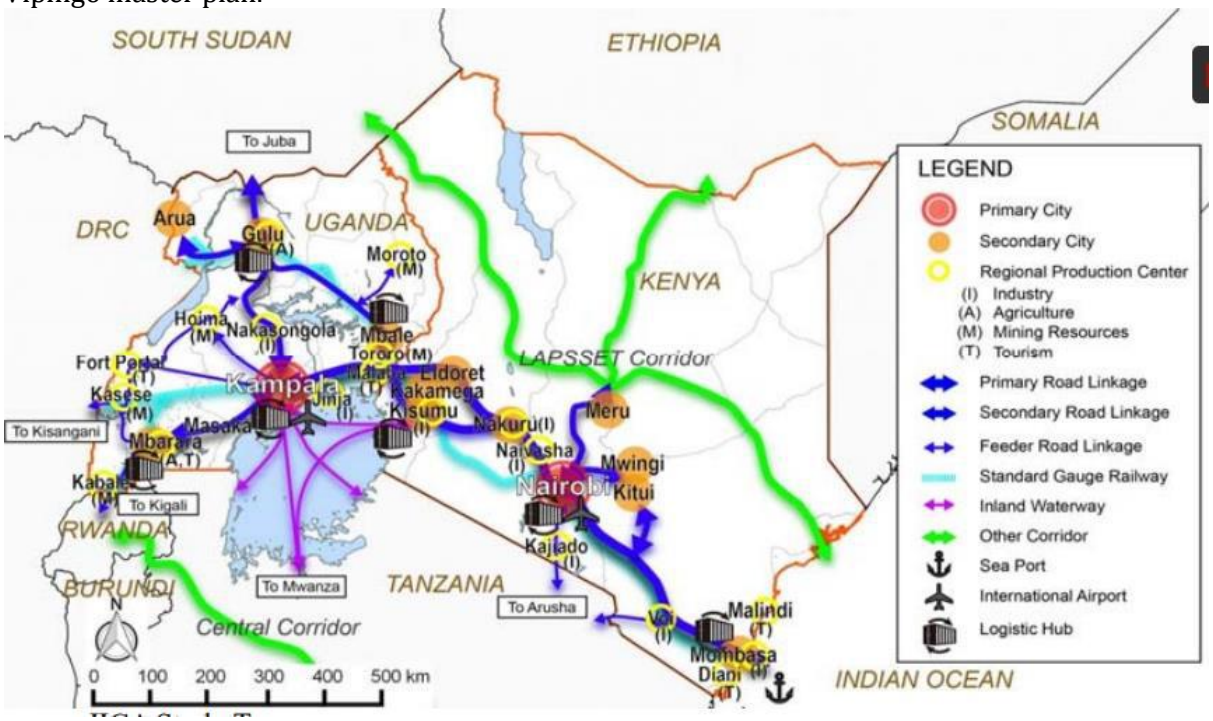


Figure 2-6: Master Plan on Logistics in Northern Economic Corridor

(Source: Master Plan on Logistics in Northern Economic Corridor)

2.8.2.2 Integrated Coast Region Master Plan (2010-2030)

The objectives of this master plan link well regionally with those of the proposed Vipingo master plan. It is a master plan that has been developed by Coast Development Authority (CDA). CDA is a regional development authority established by an Act of Parliament (Cap 449), with the mandate to plan and coordinate the implementation of integrated development projects and programmes within the whole of Coast region, including the southern part of Garissa County and the Kenya's Special Economic Zone (SEZ) and for connected purposes. The Integrated Coast Region Master Plan (2010-2030) is a development standards and guidelines for the Coast region. It serves as a repository where all developmental initiatives within the region will revolve around. CDA is also has rolled out national projects like Mwache Multipurpose Dam, Lake Challa Integrated Development, River Umba (Vanga irrigation project), Sabaki/Galana Integrated Development, Fish Port, Free Trade Port, Mining development, Social Health Integrated Development Programme and the Kenya Coastal Development Project.

2.8.2.3 Mombasa County Draft County Integrated Development Plan (2018-2022)

Mombasa County Spatial Plan's objective is to identify the spatial distribution of the resources within the county, their level of utilization and potentials, assess the existing infrastructure, their current conditions, capacity and projected demand; identify fragile ecosystems and suggest intervention measures for their protection and conservation; investigate human settlement trends and propose an appropriate hierarchy or urban centres that will spur rural development; assess the capacity of existing institution and organizations and suggest strategies to enhance their performance; suggest an integrated spatial framework that will guide the sustainable utilization of the regional resources, bring service closer to the people; spur rural-urban inter-linkages and hasten economic growth and development; and suggest priority areas for intervention.

This links well with the proposed Vipingo Mixed Use Development Master Plan. The proposed master plan borders Mombasa County to the North East offering various solutions to the challenges currently encountered in Mombasa County. Most of the challenges in Mombasa County are mainly due to congestion and overcrowding of mainly the island and the mainland. As a result, development control efforts have proven to be very difficult and the imposition of planning schemes extremely complicated. The proposed master plan will play a big role in decongesting the coastal city by provision of the same and even better amenities to the coastal population and its visitors (both domestic and international). The proposed master plan offers a lucrative decentralization strategy. Opening up Vipingo area for development knits the coastal city into an integrated complex with enough room for development and provision of better amenities in a timely period through the proposed zones in the masterplan.

2.8.3 Linkage at County Level

2.8.3.1 Kilifi County Integrated Development Plan 2018-2022

At the County level, the proposed Vipingo master plan links well with the Kilifi CIDP. Chapter Seven of the CIDP forms the core of the Plan and is prepared along the lines of Medium Term Expenditure Framework (MTEF) Sectors. It indicates priorities, strategies, programmes and projects proposed to overcome the development challenges identified in previous chapters. It also captures on-going priority projects and programmes in the respective MTEF sectors that had been identified and proposed for implementation in the previous plan period. The new projects were identified by the public in sub-county and wards level fora held throughout the county. Flagship projects relevant to the county have also been identified. The MTEF sectors are Agriculture and Rural Development; Energy, Infrastructure and ICT; General Economic, Commercial and Labour Affairs; Health; Education; Governance, Justice, Law and Order; Public Administration & Internal Relations; Social Protection Culture and Recreation; and Environmental Protection, Water and Housing. All the proposed Vipingo mixed-use development activities are in consistence with Kilifi County development goals.

2.8.3.2 Kilifi County Spatial Plan

In line with Vision 2030 and as obligated under Section 110 of the County Government Act, 2012, Kilifi County government is in the process of finalizing its County Spatial Plan, which is a key component of the County Integrated Development Plan. The draft County Spatial Plan that spans a period of 10 years is pegged on Kenya's Vision 2030 and covers the entire County land mass totaling 12,609.7 km2 (1,260,970 Ha). The plan details the spatial utilization of the land and resources situated in an area that borders the Indian Ocean to the East, Mombasa County to the South, Kwale County to the Southwest, Taita-Taveta County to the West, and Tana River County to the North. It stretches approximately 186km on North South dimension and 103km on the East West dimension, with a coastline of 165km. The County Spatial Plan, is synchronized with the thematic areas outlined in the National Spatial Plan 2015-2045. The County Spatial Plan is a ten-year county GIS based database system providing:-

a) A spatial depiction of the social and economic development program of the county as articulated in the integrated county development plan;
b) Clear statements of how the spatial plan is linked to the regional, national and other county plans;
c) Contain strategies and policies regarding the manner in which the objectives referred to in paragraph (b), which strategies and policies shall:-
    i. Indicate desired patterns of land use within the county;
    ii. Address the spatial construction or reconstruction of the county;
    iii. Provide strategic guidance in respect of the location and nature of development within the county;

iv. Set out basic guidelines for a land use management system in the county taking into account any guidelines, regulations or laws as provided for under article 67(2)(h) of the constitution;
v. Set out a capital investment framework for the county's development programs;
vi. Contain a strategic assessment of the environmental impact of the spatial development framework;

Upon completion, the Kilifi Spatial plan will link well with the spatial works conducted for the proposed Vipingo Mixed Use Development.

3 ENVIRONMENTAL AND SOCIAL ANALYSIS OF THE MASTER PLAN

3.1 Introduction

This Chapter discusses the baseline environmental assessment and detailed analysis of the areas which will be affected during execution of the proposed Vipingo mixed use development Master Plan. The chapter has been structured on the pillars of sustainability including the physical, biological, socio-cultural, and socio-economic components in the proposed Master Plan. The chapter also shows how such data link up with the proposed mixed-use development and how the physical environment and the local people may be affected. The chapter begins by highlighting a brief outline of the methodology employed in the situational analysis. The data sources used, and methods of analysis can be obtained from the SEA scoping report. Physiographic conditions are described in succeeding section with detailed description of the current environmental situation followed by the biological and socio-economic issues. A detailed socio-economic report of the proposed master plan area has been annexed.

3.2 Methodology for baseline analysis

The steps followed during the environmental baseline situation analysis were as follows:

- Environmental screening and scoping of the proposed Master Plan land uses
- Desktop studies
- Physical inspection of the proposed development area and surrounding Master Plan areas

The SEA screening process was conducted with an aim to narrow down to the most critical issues requiring attention during the SEA study. Key issues requiring attention were identified in the scoping SEA report and studied into detail in this SEA report. Environmental issues were categorized into physical, biological/ecological, socio-cultural, and socio-economic components of the proposed Master Plan.

- **Physical Environment** – topography, landforms, geology, soils climate and meteorology, air quality, hydrology etc.;
- **Biological Environment** - i.e. fauna and flora types and diversity, endangered species, sensitive habitats, wildlife within protected areas and other dispersal areas etc.; and Marine resources and conservation areas (Fisheries resources; Mangrove forest; Coral reefs)
- **Social economic environment** (including present and projected, where appropriate) - i.e., demography, agricultural activities (Sisal plantations; Subsistence crop growing; Subsistence livestock keeping), land use, planned development activities within the subproject area, employment and labour market, sources and distribution of income,
- **Socio-cultural** community structure, cultural properties, social protection and cultural issues) etc.

3.3 Data sources for environmental analysis

The identification of Vipingo master plan SEA objectives was followed by the identification of data sources for each of the sustainability criteria as outlined in the table below:

Table 3-1: Data Sources for Prioritized Sustainability Criteria

Pillars of Sustainability	Concerns/desired aims	Data Sources
Natural Resources or Bio-physical environment	Greenhouse gases emission	Kilifi County State of the environment report, 2015 National Environmental Management Authority, Kilifi County
	Land degradation	Ministry of Agriculture Kilifi county Kilifi County State of the environment report, 2015
	Water quality	Kilifi Management Water and Sewerage Company (KIMWASCO) Water Resource Authority (WRA), Mombasa
	Loss of biodiversity (flora and fauna)	Kenya Marine and Fisheries Research Institute (KMFRI), Mombasa Kenya Forest Service (KFS), Kilifi County
	Habitat loss and fragmentation	Department of Environment, Forestry and Natural Resources, Kilifi County Kenya Forest Service (KFS), Kilifi County
Social and Cultural	Loss of ancestral land	National Land Commission, Kilifi County Department of Physical Planning, Kilifi County Department of Land, Housing, Energy and Urban Development, Kilifi County
	Loss of source of livelihoods by sisal plantation workers	Ministry of labour, Kilifi County Kenya National Bureau of Statistics (KNBS), Kilifi County REA Vipingo
	Alternative sources of livelihoods	Master plan developer
	Public health	Department of Health Services, Kilifi County Health centres in Vipingo area
Economic	Economic growth and stability	Vipingo master plan Ministry of labour, Kilifi County Ministry of land infrastructure and urban development, Kilifi County
	Job creation and income generation through investment	Vipingo master plan Ministry of labour, Kilifi County Ministry of land infrastructure and urban development, Kilifi County
	Poverty reduction	Vipingo master plan Ministry of labour, Kilifi County Ministry of land infrastructure and urban development, Kilifi County
Institutional	Good governance	County Government of Kilifi
	Inter/cross County institutional collaboration and coordination	All Counties in the coast region Related master plans at the coastal region
	Institutional strengthening and capacity building	All institutions involved in urban development

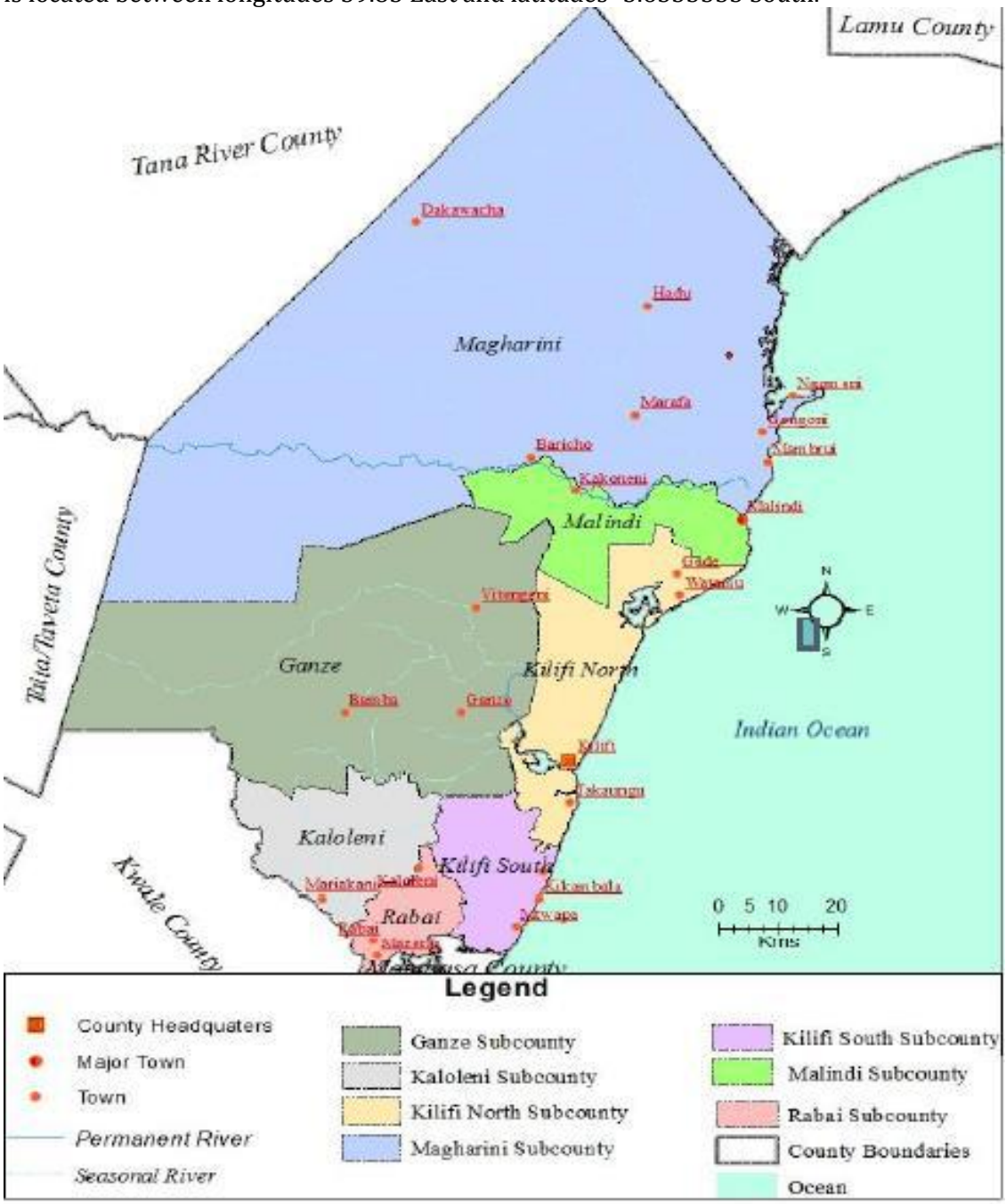
Source: *Vipingo Scoping Report 2020*

3.4 Physiographic Analysis

The physical environment describes the topography, landforms geology, soils, climate and meteorology, air quality, and hydrology.

3.4.1 Location and size of Kilifi County

Vipingo is situated within Kilifi South Constituency in Kilifi County. Kilifi is one of the fast-growing coastal regions in Kenya. Kilifi County is one of the 47 counties in the Republic of Kenya. It borders Mombasa County to the South, Kwale County to the South West, Taita Taveta County to the West, Tana River County to the North and the Indian Ocean to the East (Figure 4-1). Kilifi County covers a total surface area of 12,610 km^2 and accounts for 2.17 per cent of Kenya's total surface area. It is located between longitudes 39.85 East and latitudes -3.6333333 South.



***Source**: Kilifi County CIDP 2018 -2022*
Figure 3-1: Location of Kilifi county

3.4.2 Geology

The geology, hydrogeology and the various geological structures found in the area and immediate neighbourhood were focused on. The rocks within Kilifi area are part of a system of sedimentary and basement rocks with a generally NE_-SW strike parallel to the coastline (NESS, 1984). Specifically, the area consists of mainly rocks of sedimentary origin and ranging from recent sediments to the Pleistocene Pliocene and Jurassic small pockets of metamorphic basement rock types. The rocks are best described on the basis of age.

3.4.2.1 The Jurassic Sediments

Rocks of Jurassic and Cretaceous age occupy the foot plateau between the Coastal Tertiary series and the Duruma Sandstones. The outcrop can be traced to the west of the area around Colewa and river Mkuu and could be said to occupy most of the development area. The rocks consist of limestones, sandstones, and shales. These include the Kambe Limestone Series, Kibiongoni Beds and the Upper Jurassic shales and Limestones

- **The Kambe Limestone Series:** They overlie the Duruma Sandstone Series. The Kambe Limestone consists of a series of limestones with inter-bedded calcareous shales. These rocks occur as a bluish-grey, compact, calcitic mudstone and contain thin partings of shale. This type may also occur with an abundant fauna, particularly corals. They may also occur as a lighter grey, oolitic limestone that is inter-bedded with the other two. The Kambe Limestones can best be seen from excavations done on deep shallow wells in the area.
- **The Kibiongoni Beds:** The Kibiongoni Beds include a belt of shales, yellow micaceous sandstones, cherty mudstones, and shelly sandstones composed of sub-angular pebbles of limestone and quartz overlain by a series of thin, current-bedded, sandy shales with inter-bedded micaceous and ferruginous sandstones. Near the top is a massive band of ochreous (brownish) sandstone, which from the area of study can be seen in Bububu region brought up by burrowing animals.
- **The Upper Jurassic Shales and Limestones:** The shales are generally dark grey to black (lower horizons) and greenish grey or yellowish, higher up; on weathering, they frequently assume a lighter grey or brownish tinge. They are sandy, calcareous, sometimes ferruginous and more rarely micaceous, and contain bands of nodular clay ironstone and muddy limestone. Limestone bands can be observed at several localities.

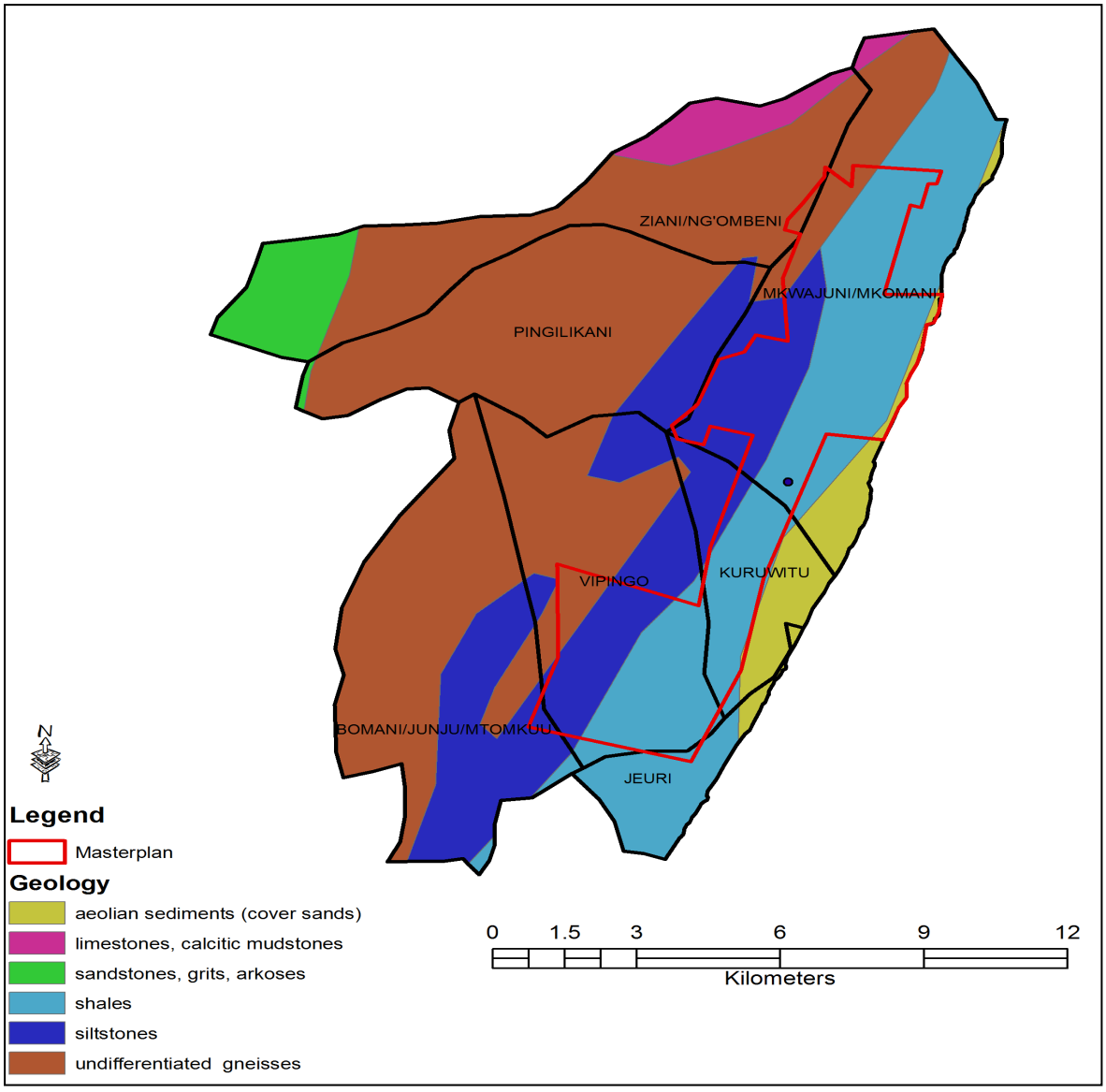
3.4.2.2 The Cainozoic Rocks

The Cainozoic rocks are confined to the coastal strip and include representatives of the Pliocene, Pleistocene, and Recent periods. The succession is as follows:-

- **The Magarini Sands:** Regionally, these form a belt of low hills running parallel to the coast and at roughly 2 to 5 km from the coast. They rest with slight unconformity upon a planned surface of Jurassic and Cretaceous rocks and occasionally overlap on to the Duruma Sandstones. The deposition is generally poorly stratified, ill-sorted, and unconsolidated, and varies in grade from silty clay to coarse boulder gravel. A bulk of the material comprising Fragments of Jurassic shales, rounded fragments of silicified fossil wood, and well-rounded pebbles of gneiss from the Basement System can sometimes be seen. The sediments outcrop to the near east of the area in Mtoni, Mkomani, Gongoni, Mikaoni, Ubauni and Solokero areas. These rocks are fine grained and rounded an indication that they were deposited as river gravels and coastal dunes under conditions of intense erosion.
- **Kilindini Sands:** The Pleistocene Kilindini sediments comprise of a wide range of textures, which include coarse sands, clayey sands, sandy clays, heavy clays, coral debris and limestone bands, which shows a combination of fluviatile, deltaic, eolean, coastal, and shallow marine formation. This formation is contemporaneous with the Pleistocene coral

reef. The boundary between the two units is a transitional one, with inter-fingering facies. The Kilindini Sands can be regarded as lagoonal deposits since they formed by the accumulation of deposits sometimes behind the fringing reef.

- **Wind-blown and Superficial Sands:** These cover the other older sediments occurring in the area. They are composed of fine sands and alluvium. These cover most of the area under master plan. The deposits are thin reaching a maximum of 1m in thickness. The proposed economic development will most likely affect the geology in terms of exaction and disposal of waste. This is due to the fact that most of the land for the proposed development site is in sedimentary formations part of which is coral reef that is fragile and might be affected extensively by the development. The Figure below shows the geology of the area.



Source: *AWEMAC GIS 2016*
Figure 3-2: Geology of the Development Area

Both the Kilindini sands and the Magarini sands are highly permeable; the latter having both primary porosity and secondary permeability due to fracturing. There are two main fracture orientations: north easterly and a north-westerly. This means that in some zones, conjugate

fracturing occurs, making it the most permeable, hence have the best possibilities for ground water abstraction. While the north-westerly fracturing tends to conduct groundwater from the recharge area to the discharge area, the north-easterly fractures tend to redistribute groundwater within the system. As such, targeting the north-easterly fractures assures striking aquifers of more uniform transmissivity, while the north-westerly will give boreholes that have a more directional, but can sometimes be of very high, transmissivity.

3.4.3 Soil Formations

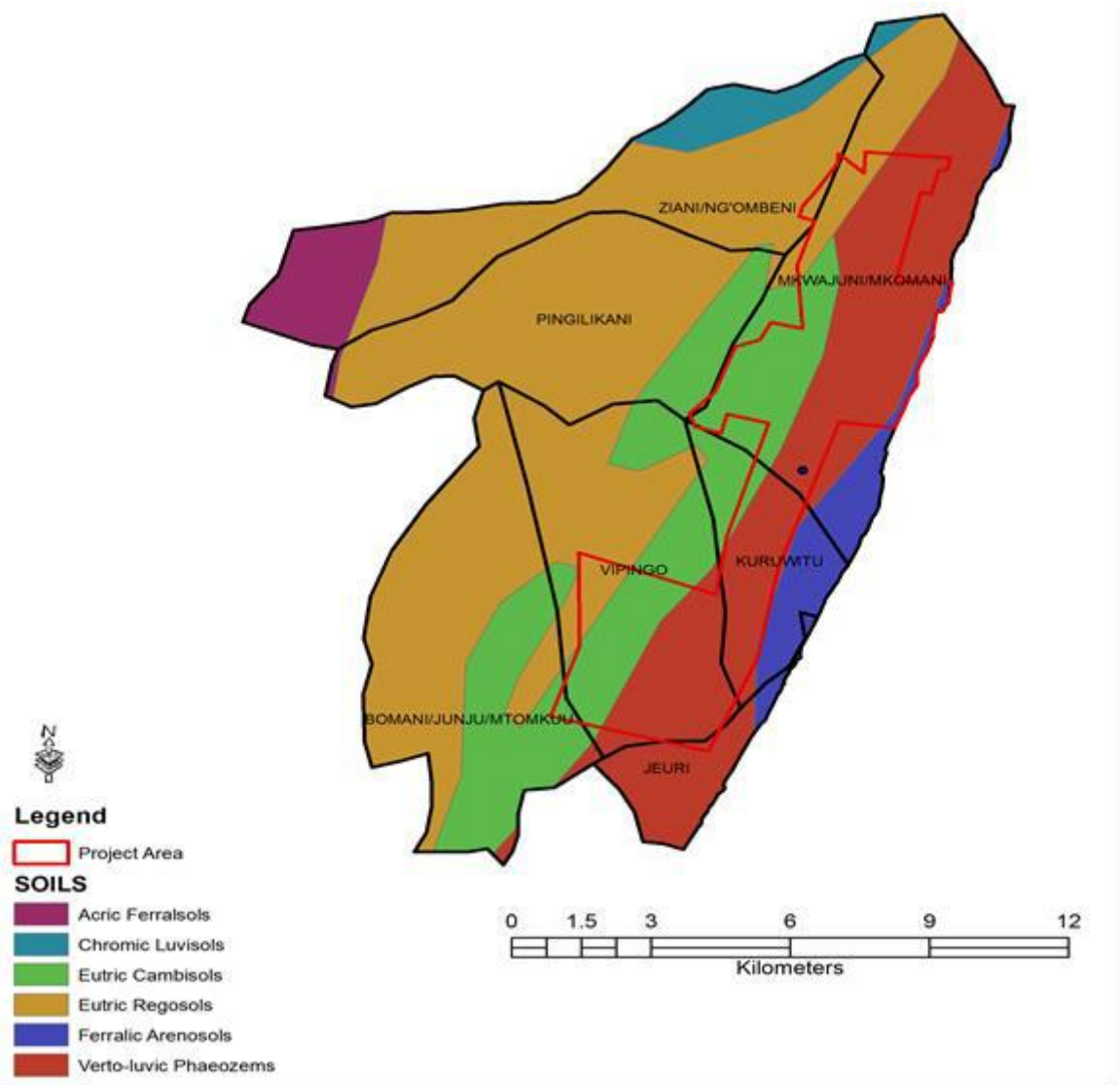
The soils of the development area are shown in Figure 4-3. The soils differ widely in depth, texture and chemical properties mainly due to the local geology (Braun, 1980). The pattern of soils can be chiefly determined by the nature of bedrock, physiography, and climate. The area is located in the Intertidal Coastal Plain**.** This belt extends from the coastline to 5-15 km width inland, rising gently (< 2% slopes) up to 20m ASL altitude. The soils of tidal plains are developed from unconsolidated recent marine alluvium over river terraces, floodplains, valleys, bottomlands, sandy beaches, coral ridges, tidal flats and swamps.

This is a zone where coastal salinization as defined by FAO (1973), takes place due to tidal marine water activity (D'Costa and Gachene, 1986). Soils of tidal flats, coastal swamps and bays are deep poorly drained, saline-alkali, mostly unripened clayey soils classifying as *Eutric, thionic Fluvisols* and *Gleysols* with saline-sodic phases, *Gleyic Solonchaks* and thionic *Histosols*. These areas abound in valuable mangrove and other natural forested woods, sedges, wildlife, fish and fauna, which need protection from overexploitation. The coral limestone ridges are mostly shallow and rocky *Eutric* and *Lithic Leptosols* and *Cambisols*. The sandy beaches are very deep *Dystric Regosols/Arenosols*, which are well suited for coconut plantations. However, these beaches and ridges serve as most viable tourist resorts and recreational areas.

The soils of alluvial terraces, flood plains and upper valleys occupy small areas. The important soils are sandy *Arenosols*, *Ferralsols* and deep well drained *Eutric* and thionic *Fluvisols*, and imperfect to poorly drained *Cambisols* and *Vertisols* with saline-sodic phases.

The Soils developed on Plio-Pleistocene Sediments (Magarini and Kilindini Sands) are imperfectly drained to poorly drained, moderately deep to deep , dark yellowish brown to light olive brown, firm to very firm, moderately alcareous , sandy clay to clay, with humic topsoil; Predominantly, moderately sodic and in places saline(mollic Solonetz; with orthic Rendzinas and verto-luvic Phaeozems)

Soils Developed on Pliocene Sandstones are the well-drained, extremely deep consisting of red to dusky red, very friable, sandy clay loam to clay (acric to rhodic Ferralsols).



Source: *AWEMAC GIS 2016*

Figure 3-3: Soil Map of the Development Area

3.4.4 Climate

The average annual rainfall ranges from 300mm in the hinterland to 1,300mm at the coastal belt. The coastal belt receives an average annual rainfall of about 900mm to 1,100mm with marked decrease in intensity to the hinterland. Areas with highest rainfall include Mtwapa and to the north of the coastal strip around the Arabuko Sokoke Forest. Evaporation ranges from 1800mm along the coastal strip to 2200mm in the Nyika plateau in the interior. The highest evaporation rate is experienced during the months of January to March in all parts of the county.

The annual temperature ranges between 21°C and 30°C in the coastal belt and between 30°C and 34°C in the hinterland. The county experiences relatively low wind speeds ranging between 4.8 km/hr and 12 Km/hr.

3.4.5 Hydrogeology

The hydrogeology of an area is intimately dependent upon the nature of the parent rock, structural features, weathering processes, recharge mechanism and the form and frequency of precipitation. Generally, the development area has medium to high groundwater potential as deduced from previous studies. Vast quantities of water are stored in sands and shales, but

production is low because of their low permeability. Much of the interstitial water is brackish or saline.

Sands, sandstones, grits, and gravels are generally both porous and permeable, while clay is porous, but impermeable. Permeability increases normally with an increasing particle size and a better rounding of the particles. Sandstones and conglomerates, therefore, are more permeable and better aquifers, than clays.

Shales, whose origin is clay through consolidation and compaction, have well marked bedding plane fissility (ability or tendency of a rock to split along flat planes of weakness "parting surfaces") primarily due to the orientation of the clay mineral particles parallel to the bedding planes. As with clays, shales may be very porous, but the permeability is almost nil.

The limestone's found in the area are of the detrital type, being made up of fragments of organic carbonate (coral, shells, algae etc.). The primary porosity of these limestone's strongly depends on the grain size, the shape of the grains and the fissuring of the rock. The secondary porosity of limestones may result from fracturing and/or dissolution of the limestone leading to karstification and formation of sinkholes. An alignment of sinkholes may indicate major flow paths of the groundwater, such as fault zones. However, no sinkholes could be detected on the aerial photograph mosaic covering the Magarini area. Further, no evidence of karstification could be found in the field and the Jurassic limestone beds within the area seem to be of limited extent and thickness.

Fracturing of the sandstones usually has a positive effect on the yield of the boreholes drilled in these rocks. A weathered sandstone layer normally has good potential as an aquifer. Most of the weathering products overlying the sandstones in the Magarini area are of low permeability, poorly drained, and in some instance saline and sodic. The thickness of the weathered layer overlying the sandstones varies from less than one metre to several meters. Therefore, the weathered layer overlying the sediments is not very promising.

3.4.5.1 Kilindini Formation/Magarini Sands

Magarini sands are generally pervious and their contact with the underlying Jurassic shales is often marked by seasonal springs. Although water from this formation is potable, it is frequently marked by objectionably high iron content. The poorly consolidated nature of the Kilindini formation gives it particularly good aquifer properties locally, although lateral variations associated with the location of the inflow channels and the reworking of the sediments can be expected.

From the geology of the area, the upper most local lithology is red wind-blown sands; it is therefore clear that the sands allow water to pass through easily as compared to the coral reefs and Kilindini sands which can be found in the deeper boreholes. Boreholes within the coral reefs are higher yielding owing to the interconnection of large dissolution cavities that are associated with them. From different studies, most outcrops of Kilindini sands have been graded as low risk area and they have a preferential absence of flow paths connecting it to the ocean. They therefore pose a lower risk of seawater encroachment.

3.4.5.2 Shallow Wells

Shallow wells have been dug in the area to tap the top (perched) aquifer. Deeper wells penetrate the main aquifer. The former usually are hand dug and normally penetrate to about 5 m in the perched aquifer in the aquitard clays and silts. Shallow wells normally dry up during the dry season or experience systematic decline in the water level. The shallow wells have fresh water though they are often bacteriologically contaminated

3.4.5.3 Upcoming Saline Interface and Safe Yield

If installed fresh water overlying saline water is pumped, the saline water beneath the well starts moving upward, due to the upward pressure gradient below the well. If pumping is continued at a steady rate, one of the following situations may develop: The saline water below the well keeps

upcoming until it reaches the well screen: the well will discharge a mixture of fresh and saline water. The upcoming of saline water reaches a certain equilibrium level at some distance below the well after a certain period. In this preferable situation, the well will continue to produce fresh water as it extracts.

The second scenario is mainly governed by high horizontal hydraulic conductivity and/or low pumping rates, assuring that the abstraction of fresh water is to a large extent compensated by horizontal inflow of fresh water and only marginally by upcoming of the saline interface. Whether the first or second situation develops depends on both the well and the aquifer hydraulic properties, the densities of the saline and fresh water, and the discharge. Due to the lack of information regarding the vertical and lateral recharge and the nature, thickness, extent, distribution, and hydraulic conductivity of the underlying saline/brackish water bearing formations, the actual values of upcoming cannot be determined.

The spin-off/spill-over effects of the proposed economic hub will probably affect the hydrogeology in the neighbourhood. Key threats that have been facing the groundwater over the years include pollution through liquid wastes discharge to the ecosystem which is expected to increase with increased economic activities. It is expected that the proposed development will put in place all the necessary precautions to cushion the ecosystem from possible negative spill over effects of the proposed development.

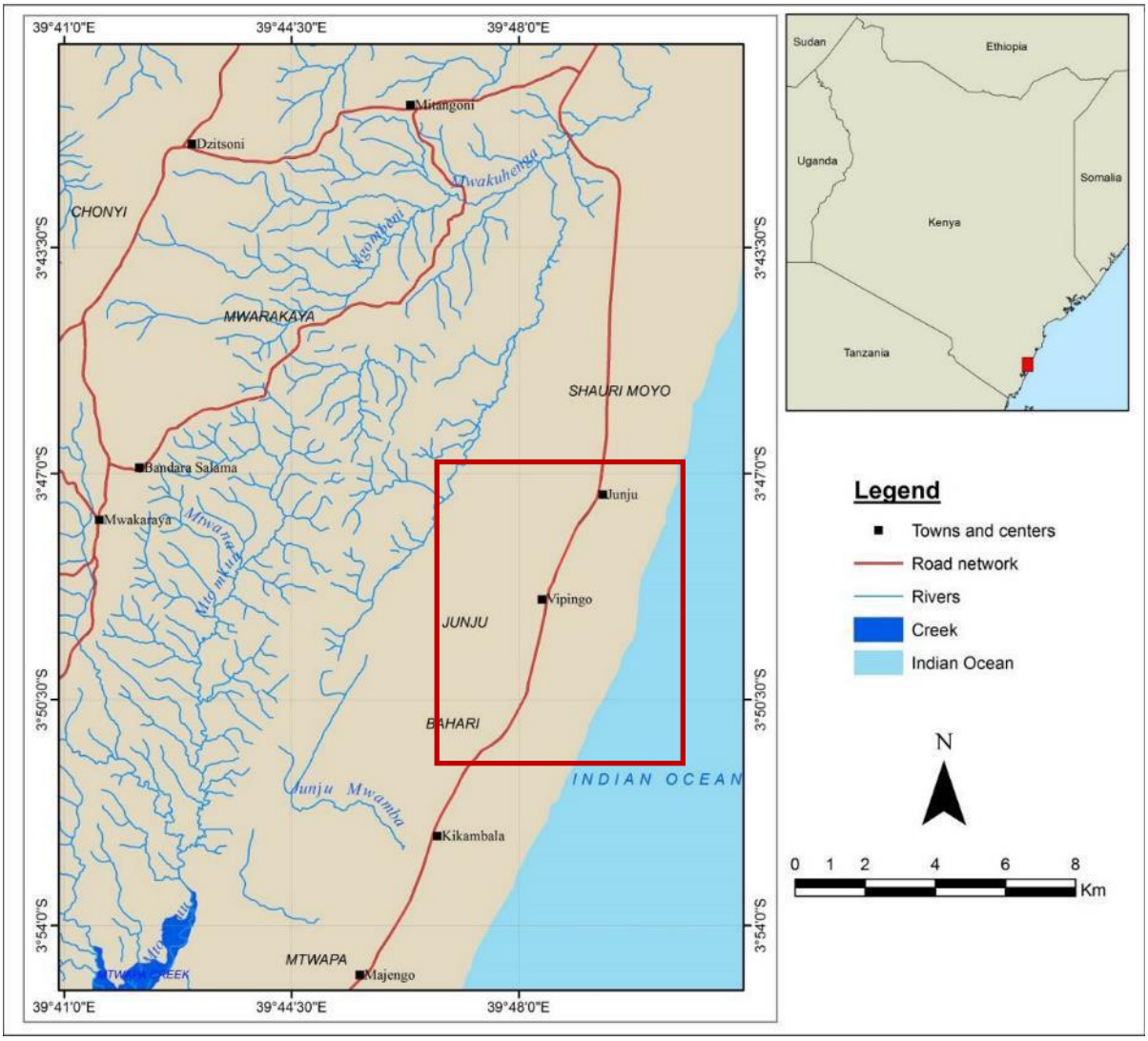
Protection of the groundwater from negative impacts from development activities is critical for a balance in supply of portable water.

3.4.6 Drainage / Water Resources

The drainage pattern for the county is formed by a permanent river (Sabaki) and seasonal rivers, which drain into Indian Ocean through the various creeks along the coastline. The seasonal rivers are Nzovuni, Rare, Goshi and Kombeni. There are also streams which include Wimbi, Muhomkulu and Mleji.

3.4.6.1 Water sources and supply

According to the Water Resources Authority (WRA), most of the coastal towns fall under the Athi sub-region, which include Mombasa, Kwale, Kilifi (development area) and partly Taita Taveta. These areas have very few or no flowing streams and rivers, thus, they are served by piped water sourced from River Sabaki, boreholes and surrounding dams. The surface water supply from seasonal streams such as Junju, Mwamba, Mtwana, Lwandani, Mto Mkuu, Ngombeni and Mwakuhenga are largely unreliable (Figure below). Therefore, the main sources of fresh water in the proposed development area, just like most parts in the coast region are River Sabaki, ground water and roof catchments (Odhengo *et al.,* 2012).



Source: *AWEMAC GIS 2016*

Figure 3-4: Water and Marine Resources Map for the Vipingo Area (Red Square Represents Development Site)

Vipingo area experiences water scarcity due to occasional continuous dry weather period of 5-6 months that occurs in some years. This impacts negatively on the water supply in the area. In addition, intrusion of saline water in some boreholes has been reported in the area (Caroline and Christopher, 2014).

Source: *AWEMAC Field Work 2016*

Plate 3-1: Mwanamia Landing Beach (03◦46.46 S, 39◦50.58 E) With Degraded Mangrove Forests at the Foreground

The development will implement multiple water solutions that include desalination plant and dams. This will ensure a cost-effective water supply for commercial and industrial consumers at rates lower than Kshs. 227.5 per cubic meter that is currently charged. The development will provide an uptime of 99% of bulk water supply for industrial, commercial, institutional, and residential consumers. Portable water will amount to 151,830,000 litres per day. There will be dams to capture surface and rainwater.

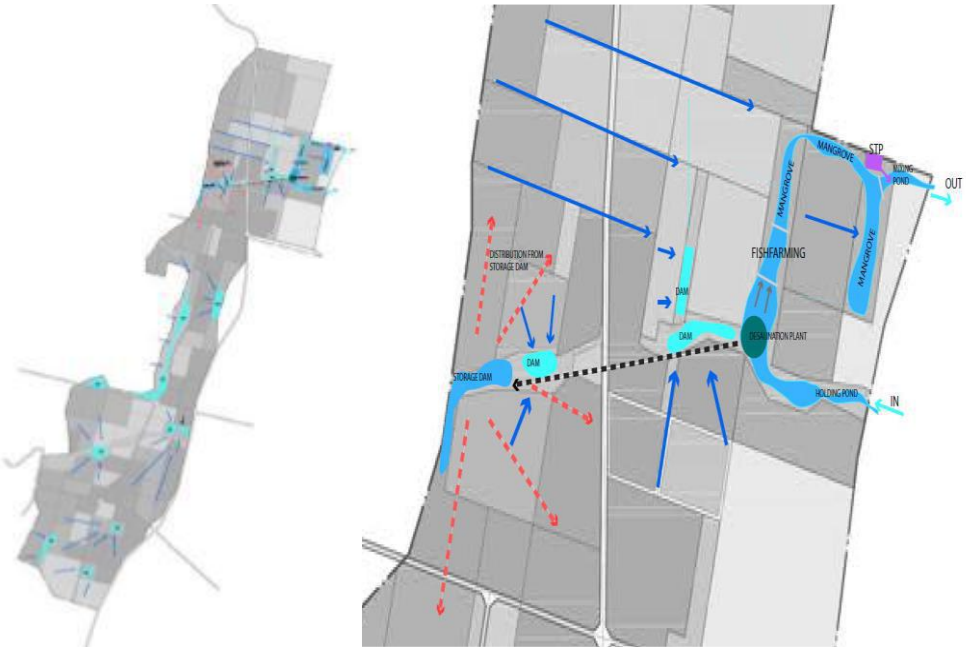


Figure 3-5: The Existing and proposed water system (Source: Athena/Centum 2015)

3.4.6.2 Water resources and supply scenario

Water supply system has been overtaken by demand, which has increased rapidly in concert with the growth of the tourism industry and irrigation schemes. The main uses of water are domestic (which accounts for 35% of the total water demand), livestock, irrigation, and industry *(Odhiambo, 2014).* These water resources are important for local communities as the main water sources for their domestic use and for cattle. The small industries such as horticultural farms around the area rely on these sources of water to sustain their activities. The proposed development is likely to have low to moderate impacts on water resources because of their

unavailability in the area. Moreover, the development proposes to implement multiple water solutions for the general area including desalinization of ocean waters and construction of dams to improve rainwater harvesting.

Scarcity and unpredictability of rainfall in Vipingo area is a major impediment to development. This has led to water scarcity, high cost of water and lack of reliable water supply to serve industrial, commercial, institutional, and residential development. Although most of the residents rely on piped water supplied by Kilifi Water Company at Ksh. 227.5 per M^3, it is the most expensive compared to other water companies in the country. In addition, the cost of water per cubic meter from Kilifi Water and Sewerage Company is Ksh. 163.5 per M^3 more expensive compared to Nairobi Water and Sewerage Company. Therefore, providing cheaper and reliable water supply solution will attract companies and residents to relocate to Vipingo development.

3.4.6.3 Water quality in the development area

Environmental baseline survey of the proposed development area was undertaken to provide data that will act as reference for the Strategic Environmental Assessment and Environmental Management Plan (EMP). The water quality parameters analysed showed that they were generally within the NEMA guideline values except for a few whose values were above the limit viewed against NEMA guideline values (1st Schedule). Data for Sabaki River and Vipingo Ridge borehole were provided by WRA as sampled on 04-11-2015 and rest by Polucon Services Ltd on 27-11-2015 *(Table 3-2).* The concentrations and levels of the listed parameters were compared with those in the first schedule on quality standards for sources of domestic water (GOK, 2006).

Table 3-2: Level of water quality indicators in the proposed development area

Sampling point/Parameter	Kuruwitu	Mwanamia	Kijangwani fish ponds	Vipingo Camp	Sabaki River	Vipingo Ridge	Guideline values
GPS	03°48.28S 39°49.99E	03°46.46S 39°50.58E	03°46.50S 39°50.06E	03°49.05S 39°47.86E		03°48.68S 39°50.70E	
Temperature (°C)	26.0	27.5	27.1	25.4	33.6	31.2	-
pH	7.4	8.0	8.5	7.7	10.2	7.0	6.5 - 8.5
TDS (mgl^{-1})	30700	32100	5080	770	250	968	1200
Conductivity (μScm^{-1})	61200	64300	9420	1300	523	1888	-
Salinity (mgl^{-1})	13046	16883	2581	279	427	1825	-
Colour (HU)	6	5	13	5	7.5	-	15
Turbidity (NTU)	0.0	0.17	40	0.0	269	0.44	-
Nitrates (mgl^{-1})	1.70	1.90	9.6	1.3	-	-	10
Phosphates (mgl^{-1})	13.10	9.60	1.7	8.3	-	-	-

Source: *Polucon Ltd & WRA Laboratory*

Water samples collected from the two marine environments (Mwanamia and Kuruwitu areas) show nutrient concentration levels like those measured in surrounding areas such as Mtwapa and Watamu (*Mwachireya et. al., 2015).* In particular, the levels of nitrates and phosphates were shown not to vary significantly over a wide coastal area stretching from Shimoni to Mombasa. It is anticipated that even with increased population and generation of wastewater in the

development area, the mitigation measures put in place will not adversely change the nutrient content of the marine environment. Besides, the proponent plans to improve sanitation in the development area by constructing efficient and environmentally friendly wastewater treatment systems.

3.4.6.4 Ground water resources

The groundwater in Vipingo area occurs in confined and unconfined aquifers in sedimentary formations of fluvial and lacustrine origin *(Caroline and Christopher, 2014).* Groundwater flow direction is generally eastward with recharge rate decreasing westward. Records of chemical analyses indicate that saline and brackish water has been encountered in more than a half of the boreholes. For the boreholes bordering the Indian Ocean, they have experienced minimal drawdown during dry weather months indicating the possibility of seawater intrusion.

3.5 Biological Analysis

3.5.1 Vegetation

The proposed economic development will not affect extensive forested land directly. This is since most of the land for the proposed development site is currently under extensive sisal plantations under Rea Vipingo. Most of the heavily forested areas are far from the development site. However, as per the master plan, sections of the mangrove forest are located at the views of Indian Ocean from the proposed development site. As such, the mangrove forests and on-farm trees in the proposed development neighbourhood will be affected indirectly by spill-over effects of the proposed development. Also, to be affected directly are the isolated and small pockets of forest plantations in the expansive sisal farm. The plantations are mainly of *Eucalyptus saligna* and *Casuarina equisetifolia*. According to tree capability mapping by KEFRI at the Kenyan coast (Tuwei*et al.* 2015), these species does well at the entire Kilifi County. The small pockets of bushlands in the expansive land will, however, be affected directly by the proposed development. The sections under bushlands include areas where sisal harvesting has been done but replanting is yet to take place.

3.5.2 Forest plantations

Isolated and small pockets of forest plantations occur in three different locations. Some are located amidst the sisal plantations. Others are in Vipingo Ridge and the rest occur on private farms adjacent the sisal plantations. The forest plantations amidst the sisal plantations will be impacted directly since they will have to be cleared to pave way for the proposed development. It is, however, important to note that these plantations are small and very few hence the impact will be minimal. To minimize the impact, it is advisable that during development implementation phase, the developer avoids clear fell on the forest plantations and probably use selective or patch logging method to leave some trees. Some of the plantations encountered amidst the sisal plantations are located near Shauri Moyo sisal estate (0592183, 9585607). Most of the plantations were of *Eucalyptus saligna* (Plate 3-2) while others were mainly of *Casuarina equisetifolia*.

Source: *AWEMAC Field Work 2016*

Plate 3-2: Eucalyptus saligna amidst sisal plantations at the proposed development site

Within Vipingo Ridge Estate, that boarders the development to the western side, several forest plantations are located adjacent the sisal plantations. At Vipingo ridge, *Eucalyptus saligna* and *Casuarina equisetifolia* plantations occur at latitudes and longitudes of 0588735 and 9582884 respectively. The Vipingo Ridge plantations and the development are only separated by a perimeter wall (Plate 3-3).

Source: *AWEMAC Field Work 2016*

Plate 3-3: Rea Vipingo sisal plantations and Vipingo Ridge forest plantations lying side by side

Other forest plantations of Eucalyptus and Casuarinas are located at point 0588330 and 9575211 latitudes and longitudes respectively. These plantations belong to Bamburi Cement Company and are separated from the sisal plantations by the Malindi-Mombasa highway (Plate 3-4). The plantations are huge though they will only be affected indirectly by spill-over effects of the proposed development. As such the negative impacts on these plantations will be negligible.

Source: *AWEMAC Field Work 2016*

Plate 3-4: Rea Vipingo Sisal Plantations and Bamburi Cement Forest Plantations

Other species encountered on-farm include: *Mellea volkensii, Mangifera indica, Morus alba, Grivellea robusta, Sesbania sesban, Psidium guajava, Carica papaya, Cajanus cajan, Jacaranda mimosifolia, Ricinus communis, Leucena lacocephela, Manihot glaziovii, Agave sisalana,Tamarindus indica, Citrus sinensis, Musa acuminata* among others.

3.5.3 Farm and Urban forestry

Urban and farm forestry are important in landscaping, reducing the heat by providing the cooling effects on the island, shade, wind break, fodder, fruits, construction materials, soil erosion control, bee foraging, medicinal value, fuel wood, nitrogen fixation among others (Cheboiwo & Langat, 2006). Farm and urban forestry is common within the proposed development and its environs.

3.5.4 Indigenous vegetation

Indigenous vegetation within the sisal plantations will be affected directly while the rest in the neighbourhood of the proposed development area will be affected indirectly by the proposed development. Within the expansive sisal plantations, isolated and small pockets of *Adansonia digitata* (baobab trees) occur amidst the sisal plantations. For instance, near Mwanamia Beach at point 0593478 and 9583079 latitudes and longitudes respectively, baobab trees occur amidst the sisal plantations (Plate 3-5).

Source: *AWEMAC Field Work 2016*

Plate 3-5: Adansonia digitate (baobab trees) amidst the sisal plantations

3.5.4.1 Baobab trees

The small pockets of baobab trees will be affected directly by the proposed development. It is likely that most the baobab trees will be cleared to pave way for the proposed development. It is important to note that it is difficult to grow the baobab trees artificially. Further, forest parallel configuration processes to be affected include species diversity and composition while cyclic processes will entail nutrient cycling (Gaaf, 1986). Invasion of non-native plant species (Henderson, 2001) as gaps are opened may lead to an individualistic succession pathway (Henderson, 2001; Mutiso *et al*. 2011). As such, it will be advisable to the developer to avoid destruction of the trees unless it is mandatory. Retaining the trees for landscape aesthetic will go a long way in minimizing the impacts. Enrichment of some selected areas with such species will go a long way in mitigating the negative impact.

3.5.4.2 Coconut Groves (Cocos Nucifera) and Cashew Nuts

Other common indigenized species in the neighbourhood of the entire Vipingo land include the extensive coconut groves (*Cocos nucifera*) and the cashew nuts. The two species are important cash crops not only in the Vipingo area but also in the entire coast region. According to the Kenya Integrated Household Budget survey 2005/2006, the two indigenized species have been categorized as key cash crops in Kilifi region. At Makonde village (0590617, 9587778), the extensive coconut groves spills-over to the sisal plantations (Plate 3-6).

Source: *AWEMAC Field Work 2016*

Plate 3-6: Coconut groves spills-over to sisal plantations at Makonde village

Any *Cocos nucifera* inside the sisal plantations will be affected directly by the proposed Vipingo economic hub. Probably, most of them may be clear-felled by the developer to pave way for the development. It is, however, advisable that the developer avoids unnecessary destruction of the isolated stems of the Coconut trees amidst sisal plantation. Note that the species is a key indicator of the coast line. As such, retaining the species will not only add landscape aesthetic but also bring on board the natural species composition of the coastal area. It is advisable that the developer considers enriching the development site with more *Cocos nucifera*.

3.5.4.3 Mangrove Forest

At Mwanamia Beach (0593478, 9583079) are remnants of badly degraded mangrove forest. The mangrove site is less than 50m from the sisal plantations (Plate 3-7) at the proposed site for Vipingo development. The spin-off/spill-over effects of the proposed Vipingo economic hub will probably affect the mangrove forest in the neighbourhood. Key threats that have been facing the mangrove forest over the years include pollution through liquid wastes discharge to the ecosystem and forest disturbances especially by salt processing companies. It is expected that the proposed development will put in place all the necessary precautions to cushion the remnant mangrove stretch from possible negative spill-over effects of the proposed development. It is also important to note that the Mombasa Cement lies adjacent the same stretch of mangrove forest. The quarrying activities probably have been affecting the remnant mangroves at the site. When disturbances are cumulative, ecosystems are known to breakdown and shift to alternative state (Kumar, 2001; Frelich *et al.* 1999). As such further disturbances to the remnant mangrove at the site might be detrimental not only to the mangrove ecosystem but also the corals sheltered by the remaining trees. The proposed development should adhere to protect mangrove forest in the vicinity of the proposed development.

Source: *AWEMAC Field Work 2016*

Plate 3-7: Degraded mangrove stretch adjacent to the sisal plantations at Mwanamia beach

Typically, in coastal areas, the mangrove ecosystem occurs chiefly on muddy, sheltered shores subject to periodic submersion. The forests may occur in widths varying from a few hundred yards (100 meters) to as much as 12 or 15 miles (19 to 24 kilometres). Characteristic species have, for example, special physiological features and structural adaptation to withstand periodic flooding salinity of the water and consequent "physiological dryness".

The mangrove forest is an important ecosystem at the Kenyan coast. Apart from providing a wide range of benefits to the local people, it cushions the mainland against the negative impacts of the strong ocean currents and natural catastrophes such as tsunamis, decontamination of ocean waters, carbon sequestration among others (Wekesa *et al.* 2015). In terms of flora, common species that make up the mangrove ecosystem in the proposed development neighbourhood include *Rhizophora*, *Bruguiera*, *Heritiera*, *Sonneratia, Xylocarpus, Avicennia* and *Armora*. The mangroves extend from the neighbourhood of the proposed development area to the bird watching site of Mida Creek near the Arabuko Sokoke National Park and the town of Watamu, and the Lamu Archipelago, which are fed by constant streams of fresh water.

It is important to note that the mangrove ecosystem near the proposed development area and the entire coastline have been subjected to a wide range of threats. The mangroves have been harvested for centuries not only for timber but to pave way for urban areas, salt panning and agriculture including rice growing and shrimp cultivation. The habitat is further diminished by pollution of rivers from urban and industrial waste and agrochemicals. Wekesa *et al* (2015) document that oil spillage and siltation immensely affect mangroves leading to high levels of degradation and loss of specific mangrove species. Moreover, recovery of mangrove forests degraded because of oil spillage and siltation is slow and difficult to achieve without human intervention. Urban areas near the mangroves include Lamu, Malindi and Mombasa. Protected areas include Watamu Marine National Park and Ras Tenewi Marine National Park.

Other indigenous species common at the proposed development area and its neighbourhood include *Vangueria apiculata, Ficus sycomorus, Caesalpinia decapetala, Maytenus senegalensis, Rhus vulgaris, Manilkara mochisia, Balanites eagyptica, Acacia xanthophloea, Grewia bicolour, Vangueria infausta, Garcinia livingstonei, Acacia tortilis, Acacia mellifera, Acacia seyal, Acacia senegal, Lannea alata, Vangueria madagascariensis, Caesalpinia volkensii, Ficus sur, Acacia nilotica, Rubus pinnatus, Sesbania sesban, Euphorbia turicali, Terminalia brownii, Plectranthus barbatus, Pappea capensis, Premna resinosa, Zanthoxylum chalybeum, Vangueria apiculata, Cordia africana, Acacia brevispica* among others

3.5.5 Bushlands and Shrubland

In the expansive Rea Vipingo land that is proposed for the development, pockets of bushlands amidst the sisal plantations do occur. Some of the bushlands are areas where sisal harvesting was

done, and replanting is yet to be done (Plate 3-8). According to Rea Vipingo, some of the areas under bushlands are in their replanting schedule. However, bushland areas at the site proposed for phase 1 will not be replanted since development is expected to start-off at that site. To this end, the long-term existence of the bushlands is at stake since they will either be cleared to pave way for short-term replanting of sisal plantations or for the proposed development. This clearance will result to direct negative impact on vegetation cover in entire area proposed for development. Bushlands play critical roles in providing a wide range benefits to the local people, acts as habitat to wildlife, and supports critical ecological processes such as water and nutrient cycling, soil decontamination, among others.

Source: *AWEMAC Field Work 2016*

Plate 3-8: Sections of bushland at the proposed development area

3.5.6 Wildlife

The proposed development area and the neighbourhood farms are rich in small fauna such as a wide range of rodents. According to Rea Vipingo plantations supervisor, snakes are common in sisal plantations. However, the plantations and the neighbourhood farms being agro ecosystems characterized by a wide range of human modification and disturbances, the abundance of the wildlife is expected to be low. Natural ecosystems occur in the neighbourhood of the proposed development area in two places: the degraded mangrove at Mwanamia Beach and extensive natural forests at Vipingo Ridge.

At Mwanamia Beach and adjacent the sisal plantations, remnant mangrove ecosystem exists. Naturally, the mangroves ecosystems are expected to house a wide range of faunal biodiversity. Protection of the mangrove from negative impacts from development activities is critical since the ecosystem is rich in terms of fauna. The mangroves are an important habitat for a variety of wildlife from fish, crustaceans and molluscs (Wekesa *et al.* 2015) in the waters to snakes and monkeys such as Sykes' Monkey, antelopes, elephants and African Buffalo that graze on the fringes of the swamps. Larger animals that feed in the swamp waters include hippopotamus, green turtle, hawksbill turtle, and olive ridley turtles and important populations of the endangered dugong. Located alongside coral reefs, these mangroves are sheltered by the coral from ocean tides and storms, and the swamps provide food for the many fish, shrimps and other marine fauna that shelter in the coral. The swamps are also important feeding grounds for large numbers of migratory birds such as Curlew Sandpiper, Little Stint and Caspian tern, water-birds such as Crab-plover, Yellow-billed Stork and Malachite kingfisher, and seabirds such as Roseate Tern. Since the mangroves at Mwanamia Beach are badly degraded, the faunal diversity is expected to be low.

Source: *AWEMAC Field Work 2016*

Plate 3-9: Remnant Mangrove Ecosystem at Mwanamia Beach

At Vipingo Ridge, extensive stands of natural forests occur at point (05862279, 9579377) near the Mango Camp (Plate below) A few wildlife species exist. Key among them includes several species of primates such as monkeys, bird species and reptiles such as snakes. Since the natural forests are really disturbed, the faunal diversity is expected to be high. A snake park has also been established within the Vipingo ridge.

Source: *AWEMAC Field Work 2016*

Plate 3-10: Thick Natural Forest at Vipingo Ridge Adjacent the Proposed Development Area

3.5.7 Marine resources and conservation areas

Coastal and marine ecosystems, which include tropical rainforests, estuarine and near-shore areas and the open ocean, are among the most productive, yet most highly threatened ecosystems

in the world. These ecosystems provide essential ecological services, support production, and provide livelihood and income-generation opportunities for coastal and inland populations. Vipingo Beach has an isolated and important pocket of coastal forest that provides an important sanctuary for many coastal forest species of flora and fauna. The forest meets with white sandy beaches and old coral cliffs, and on spring high tides the Indian Ocean laps at the feet of this valuable, yet threatened ecosystem. The main beaches in the Vipingo area are Vipingo, Kuruwitu, Kijangwani, Mwanamia and Takaungu. Some of these beaches are conservation areas that play an important ecological function as breeding grounds for endangered sea turtles and birds. However, these fragile ecosystems face degradation due to pressure from human activities in the area. The area also consists of small local Swahili villages, fish ponds *(Plate below),* residential properties near the beach and the famous Vipingo Ridge Golf Resort.

Source: *AWEMAC Field Work 2016*

Plate 3-11: Tilapia Fish Ponds at Kijangwani Area (03◦46.50 S 39◦50.06 E)

3.5.7.1 Fisheries resources

A small part of the population in the Vipingo is dependent on fishing as a means of livelihood, especially the fishing villages of Kuruwitu, Kijangwani, Mwanamia and Takaungu. Even though the area is not a major fish spawning ground, the development may have some limited impacts in water quality that may affect and reduce fish stock in the area. The fishers in the Vipingo area are mainly artisanal deploying very basic fishing gears and vessels such as spear guns, long lines, traps, sein nets, dugout canoes and dinghies. Artesanal fishers usually operate for 5 to 6 days a week over a 10 to 11 month fishing season every year *(Fulanda et al., 2011).* The main fish landed from the artisanal fishery of Kijangwani and Mwanamia sites include rabbit fish, parrot, butterfly, snapper, barracuda, tuna, prawns, crabs, sharks and rays, sardines, oysters and octopus. The proposed development will thus affect some landing sites thereby displacing the artisanal fishermen from their traditional fishing landing sites. An important mitigation measure for fisheries will be to construct better/modern landing sites as well as equipping fishermen with enhanced fishing gears/motorized boats. In the artisanal fishery north of the proposed development area, it was demonstrated that harvest of fisheries resources could be increased more than two fold with appropriate fishing technologies *(Fulanda et. al, 2011).* The Beach Management Units (BMUs) will also be trained on a variety of issues related to wise utilization of fisheries resources. It is proposed that the proponent considers putting up cold storage facilities/depot to help fishers reduce post harvest losses.

3.5.7.2 Mangrove forests

At Mwanamia Beach (03 ◦ 46.46 S, 39 ◦ 50.58 E), there are remnants of degraded mangrove forests. Mangrove forests are constantly under threat from overexploitation. It is expected that the proposed development will put in place necessary measures to prevent possible negative effects to this ecosystem. Mangrove ecosystem occurs chiefly on muddy, sheltered shores with periodic submersion. Characteristic species have special physiological features and structural adaptation to withstand periodic flooding, high salinity of the water and consequent "physiological dryness".

Although there is no expansive mangrove forest in the proposed Vipingo Development area, the mangrove ecosystem plays an important role at the Kenyan coast. Apart from providing a wide range of benefits to the local people, it cushions the mainland against the negative impacts of the strong ocean currents and natural catastrophes such as tsunamis, decontamination of ocean waters, carbon sequestration among others *(Wekesa et al. 2015).* The common species that make up the mangrove ecosystem in the proposed development area include *Sonneratia alba, Rhizophora mucronata, Bruguiera gynorrhiza, Xylocarpus granulata,* and *Avicennia marina*. The mangrove extends from the neighbourhood of the proposed development area to the bird watching site of Mida Creek near the Arabuko Sokoke National Park and the town of Watamu, and the Lamu Archipelago, which are fed by constant streams of fresh water. Urban areas near the mangroves include: Lamu, Malindi and Mombasa. Protected areas include Watamu Marine National Park and Ras Tenewi Marine National Park. In addition, mangroves provide non-wood forest products including fisheries, herbal medicines, tannins, and fodder *(NMMP, 2015).*

3.5.7.3 Coral reefs

Coral reefs are diverse underwater ecosystems held together by calcium carbonate structures secreted by corals. Coral reefs grow best in warm, shallow, clear, sunny waters. They are tropical shallow water ecosystems that flourish best at temperatures between 25 ◦ C and 29 ◦ C. The reef building corals need sufficient light to grow well. For this reason, coral reefs are often found close to the land, frequently forming a continuous band parallel to the shores. On the Kenyan coast, and in the proposed development area, genera of corals commonly found include *Acropona, Porite, Povina,* and *Pocillopora (Mwachireta et. al., 2015).* At Mwanamia and Kuruwitu beaches, coral rocks and cliffs could be seen and play an important role in shoreline protection, tourism and habitats for a wide range of tropical fish species. The terrestrial influence of sediments and turbidity on the coral ecosystem cannot be downplayed. However, a thriving coral community has been observed in the surrounding development area attributed to the high tidal range, hydrodynamic conditions, and likely presence of sediment acclimatized/tolerant coral species *(Mwachireya et. al., 2015).* The same study suggested that high coral recruitment levels can occur in reefs with moderate sedimentation rates and that the effects of sedimentation on algae in coral reefs are much more complex.

With respect to the coral ecosystem and the marine environment in general, the development proponent will be advised that due to the fragile nature of coral reef ecosystems, adequate measures should be made to prevent increased land-based pollutants and runoffs from the development as they may lead to excess nutrient enrichment and increased turbidity in the adjacent waters. Other threats to the corals include climate change, oceanic acidification, blast fishing, overuse of reef resources, and harmful land-use practices. These threats to the corals highlight the need for heightened concern for their conservation to minimize the risks and impacts posed by these threats. On the Kenyan coast, the regions known to be largely dominated by fringing coral reefs include the Funzi-Shirazi bay, the Diani-Chale area, Malindi-Ungwana Bay, the North Kenya Bank and the Lamu Archipelago *(Fondo, 2004, Maina, 2012).* It is therefore apparent that Vipingo Development area is likely to have minimal impact on these sensitive coral ecosystems.

3.5.7.4 Kuruwitu Community Conservation Area

The Kuruwitu marine conservation area lies a few kilometres south of the Vipingo development area (Plate 3-12). Kuruwitu extends approximately 8 km along the coast touching on the

Takaungu and Kijangwani beaches that fall under the development area. The area is characterized by a mosaic of white sandy beaches with clear water, coral reefs, coral platforms, caves, lagoons, ancient indigenous coastal forests, and unique inland mangrove swamps some 1.5 km from the sea (*Maina et al., 2011).* The marine and coastal component provides important habitat and breeding grounds for a diversity of fish and corals.

The proposed activities by the proponent are likely to have low impacts on adjacent marine ecosystems such as Kuruwitu. Kuruwitu is among the famous sites in Kenya where many ornamental fish species can be found and any disturbance can have lasting effects. The inter-connected sea-mangrove swamp/coastal forest habitat is home to many plants, and wildlife including birds, monkeys, baboons, lizards, diverse corals and ornamental fish as well as marine turtles (*Melita et al., 2013).*Anthropogenic pressures have led to the degradation of marine and coastal resources, putting the very livelihoods of coastal communities in jeopardy.

Source: *AWEMAC Field Work 2016*

Plate 3-12 Kuruwitu Community Conservation (03◦48.28 S, 39◦49.99 E) Site - Landing Beach

3.6 Socio-Economic Analysis

The various social economic aspects (demography, economic conditions, land acquisition, infrastructure, sanitation, agricultural activities, and social protection) of the development area were integral to the SEA and aimed to inform in the proposed Master Plan. A household socio-economic survey was also conducted to understand the key social dynamics of the local population *(Annex 1 - Household socio-economic survey report).* The obtained quantitative and qualitative data was analysed and applied in different contexts and settings to reach informed decisions. This assisted to build on local knowledge and participatory processes.

3.6.1 Household Socio-Economic Surveys

The survey aimed at providing data on socio-economic aspects of the people living in and around Vipingo plantations. It majorly focused on the respondents' background in terms of demographic characteristics, education level, occupation, family income and expenditure, water sources and utilization, environmental issues, energy issues, housing typology, public health issues, agricultural production, land tenure systems, livestock production and composition type, benefits in terms of social, economic, health, gender and environment and the general community perception on the intended development. The data is critical to the County Government and the developer for purposes of guiding investment and national development policy decisions. It also provides a reflection of the social economic status of the residents living in Vipingo plantations, Kilifi County.

3.6.1.1 Goal and Objectives of the Socio-Economic Survey

The overarching goal for the survey was to collect a wide spectrum of socio-economic data required to providing a baseline survey that is unprecedented in its level of detail, coverage, and quality before the new development.

Specifically, the survey had the following objectives:

a) Identify the community needs and expectations concerning the proposed Vipingo master plan
b) Appraise the existing socio- economic situation in the proposed Vipingo master plan area.
c) Asses the social requirements such as education, health, water resources and other social amenities in the area.
d) Assess the land tenure system with special reference to local communities in Vipingo Development area
e) Assess the living standards/economic status of the communities before the commencement of the proposed Mixed-use Development.
f) Assess household survival and livelihood strategies in the area

3.6.1.2 Methodology

Survey tools were prepared for effective and systematic interviews by the socio-economic consultant assisted by a team of experts on the baseline survey. The tools included; structured household questionnaires, focus group discussions checklist, key informant questionnaire, sampling of the areas and villages to be visited, field visits and observations; and triangulation of field data, which specifically focused on the local communities who stay within and around the proposed site.

3.6.1.3 Sample design and survey coverage

The team adopted a sample size that was appropriate in gathering enough information for socio-economic survey, analysis and reporting. Interviews were carried out at household level using detailed questionnaires. Sampling for the villages was done prior to the field survey date. However, reliable information on their specific numbers in the village varied. A total of Three Hundred and Thirty (330), heads of households were randomly selected to the sampling design which involved a number of villages as elaborated in this section. The following villages living in the Vipingo Sisal plantations were interviewed; Vipingo Main Estate, Vipingo trading centre, Shauri Moyo, Bureni and Kambi ya Funza among others. Those surrounding Rea Vipingo Sisal Plantations that were interviewed included; Shariani, Takaungu, Timboni Trading centre, Vipingo Petrol Station, Makonde, Kabeche, Takauni, Mukomani, Kadsinuni and the two beaches of Mwanamia and Kijanguani. Their responses concerning the proposed project were revealed through the survey as discussed in this report.

3.6.2 Demographics

3.6.2.1 Population Size and Composition

Kilifi County is administratively and politically divided into seven sub-counties: Kilifi North, Kilifi South, Kaloleni, Rabai, Ganze, Malindi and Magarini (Government of Kenya, 2015). Data from the 2019 National Census show that Kilifi County had a population of 1,453,787 people out of which 704,089 were males, 749,673 females and 25 intersex.

The main communities residing in Kilifi County include seven Mijikenda sub-groups (Giriama, Choy, Jicama, Kimber, Kama, Rabai and Robe), the Bakunin, Swahili, and people of Arab, Indian and European descent who have permanently settled in the county. There are other Kenyan communities who have also settled in the County because of their employment or for purposes of

doing business. Over time, these people have had close interactions with each other, and fostered the Swahili culture and language. Most of the people in Kilifi County are either Christians or Muslims, though other smaller religious communities exist.

3.6.2.2 Education

The overall literacy rate in Kilifi County stands at 68%. From this proportion, 51% are male while 49% are female. According to the Kilifi CIDP, the county has 935 ECD Centres, 418 Primary Schools, 86 Secondary Schools and 1 Public University (Pwani University). In terms of ratio, the teacher-pupil ratio in primary school is 1:85, which is more than twice the recommended national ratio of 1:40. The population without formal education together with those in primary level education account for 2/3 of the total population (GoK, 2018). There is need to improve the physical conditions of the existing institutions and build more to ensure quality and access to education (Republic of Kenya, *Kilifi County Integrated Development Plan 2018- 2022**).***

3.6.3 Land Use

Land is an essential factor of production, as such people utilize it for various socio-economic purposes. In the Vipingo Mixed Use Development area, resident not only use land for settlement but also practice agriculture/farming (poultry, livestock farming).

3.6.3.1 Agriculture (food/cash crops and livestock)

The main land use at the proposed development site is agriculture both food/cash crop growing and livestock keeping. Food/cash crop growing is mainly large-scale agriculture characterized by sisal plantations under Rea Vipingo and subsistence farming by peasant farmers (sisal estate workers). Small scale livestock farming is undertaken by the neighbourhood communities (Ongugo *et al*. 2013) while large scale livestock keeping occurs at Sumra dairy farm adjacent to the sisal plantations.

3.6.3.2 Sisal plantations

The Vipingo Estate, proposed for land use change, has a land area of 10,254 Acres (Centum, 2016). The annual sisal fibre production of Vipingo is close to 5,000 tonnes. Over 3,000 people depend on the sisal estate for their livelihoods. At least 700 people have been employed on casual and permanent basis. Most of the people are housed in the estates which also have medical facilities for the employees and their dependants, as well as schools and other amenities. The proposed development will have direct impact on the existing sisal plantations. These plantations occupy most of the land proposed for the mixed development (Plate 3-13). By the time the development is complete as per the master plan, the plantations will be cleared to pave way for the proposed development. This will negatively affect the agriculture sector in Kilifi County.

Sisal Plant: The sisal plant is a member of the plant family of "agavaceae" which is indigenous to the arid zones of North and Central America. The plant is characterised by its leaves which grow to a length of over one metre and yield a long, creamy-white and very strong fibre. Able to sustain quite extended periods of drought, sisal is a hardy plant that can prosper in areas of limited rainfall. Introduced to East Africa in the late nineteenth century, the species "Agave sisalana" formed the original basis for commercial production of sisal. This species is still grown in some parts but the REA Vipingo estates almost entirely use a hybrid species that gives greater fibre yields over the life cycle which, typically, covers a period of about 10 years.

Sisal plants can be grown from seeds but the identical replication of planting material requires vegetative propagation. This occurs in two forms, suckers and bulbils, the latter being REA Vipingo's preferred method of nursery establishment. After twelve to eighteen months in nursery conditions, young plants are planted out in the field, usually at a density of approximately 3000 plants per hectare. A first "cut" or harvest is taken 24 to 36 months after field planting and harvesting then continues every six to nine months thereafter throughout the plants' remaining life. This is terminated by the plants' single flowering which sees the emergence, from the centre

or "bole" of each plant, of a stalk, known as a "pole'. Poles grow to a height of about six metres and, just before attaining their full height, put out branches which carry flowers and then produce bulbils, after which the poling plants die.

Sisal harvesting: Harvesting is carried out by hand. All lower leaves, standing at an angle of more than 45 degrees to the vertical, are cut away from the bole of the plant with a sharp flexible knife. After harvesting, the leaves are transported to a central factory and decorticated to extract the cortex of ribbon fibres that run along the length of the leaves.

Sisal fibre extraction: Extracted fibres are extensively washed during decortication, sun dried, brushed to separate and align the individual strands of fibre, graded and packed into bales. The REA Vipingo group has been paying considerable attention to the decortication, brushing and grading processes and, as a result, produces some of the best quality fibre available on the market. However, sisal is currently facing a global competition from cheap synthetic products.

Source: *AWEMAC Field Work 2016*
Plate 3-13: Sections of the expansive sisal plantations at the proposed development area

It is important to note that the proposed mixed development will take place in phases. As such, the sisal plantations will not be replaced at the same time. The developer has leased back the land to REA Vipingo to continue harvesting sisal and land conversion will only be taking place at the appropriate time of a specific development phase. By the time the entire mixed development is complete, not all agricultural land will be lost to other land uses. From the master plan, a section of the land will be used for urban agriculture. As per the Master Plan, land has been set aside for sisal growing in the proposed mixed development.

Apart from loss of agricultural land to other development activities, of key concern is the loss of livelihood source by the over 3000 people in the sisal estates and the fibre processing plants within the sisal estates. Smooth and gradual transition from agriculture to other land uses will minimize the impact and will create additional direct and indirect employment opportunities in construction, industries, hospitality among others. Sensitizing the workers on the proposed land use change and other alternative livelihood sources will reduce the impact.

3.6.3.3 Subsistence farming

Though the Vipingo communities practice subsistence farming, land tenure is a major challenge. The community does not own land. According to Rea Vipingo, in the past, the company used to rent some of its land to the local community members to cultivate at a token rent (Harrison, 2005). However, this has since changed and only workers are given land to cultivate within the

sisal plantations (Plate below). The workers can only grow seasonal crops. The area they can cultivate is, also, too small and there is lack of farming equipment. In the neighbourhood of Rea Vipingo sisal plantations, subsistence farming is practiced as observed at Makonde village (0590617, 9587778). According to Ongugo *et al* (2013), cash crops grown in the neighbourhood of the sisal plantations include cashew nuts, coconut palms, pineapples and mangoes (Plate 4-15). Staples like banana, cassava, maize, green grams, cow peas, vegetables are also cultivated (Harrison, 2005).

Source: *AWEMAC Field Work 2016*

Plate 3-14: Subsistence Food Crop Growing Within the Sisal Plantations

The proposed Vipingo economic hub will negatively affect subsistence farming by the Vipingo community. Sisal estates workers cum small holder farmers will be affected in two ways. First, they may lose their wages/salaries once the sisal plantations are replaced by the proposed development. Secondly, they may lose the opportunity to do subsistence farming on the small parcels of land where sisal has been harvested as the developer will be constructing on those parcels. To minimize the impact, it is prudent for the developer to ensure smooth and gradual land conversion. Renting out undeveloped land to the Rea Vipingo will reduce the impact of the proposed development. Provision of alternative livelihood sources such as employment opportunities in the proposed mixed development will greatly reduce negative impacts.

Source: *AWEMAC Field Work 2016*

Plate 3-15: Subsistence Farming at Makonde Village Adjacent to the Proposed Development Area

3.6.3.4 Subsistence livestock keeping

Cases of small-scale livestock keeping occur at the proposed development area and the larger Kilifi County (Ongugo *et al*. 2013). Keeping of big livestock such as cattle, goats, sheep, donkeys is prohibited within the sisal plantations. However, small stocks such as poultry, ducks among others do occur within the sisal plantations especially in the four estates occupied by the sisal workers. Guards patrolling the sisal plantations ensure livestock is kept off the plantations. Big stock such as cattle, however, occasionally stray and graze within the sisal plantations as observed at point (0591700, 9589615) in plantations near Mombasa cement (Plate below).

Source: *AWEMAC Field Work 2016*

Plate 3-16: Stray Livestock Graze on Plantations near the Mombasa Cement

It is important to note that a lot of grasses occur within the sisal plantations and the young sisal plants are also palatable to livestock. The proposed development will not only do away with the grasses and sisal but will most probably fence off most of the land. This will deny the stray livestock their source of food especially during times of scarcity. However, given that grazing is illegal in the sisal plantations, the negative impact will be negligible.

Small scale livestock keeping take place in the households neighbouring the sisal plantations (Plate below). Such livestock keeping activities in the neighbourhood of the proposed development area will not be affected directly by the proposed development and the spill-over negative impacts to subsistence livestock farming will be negligible.

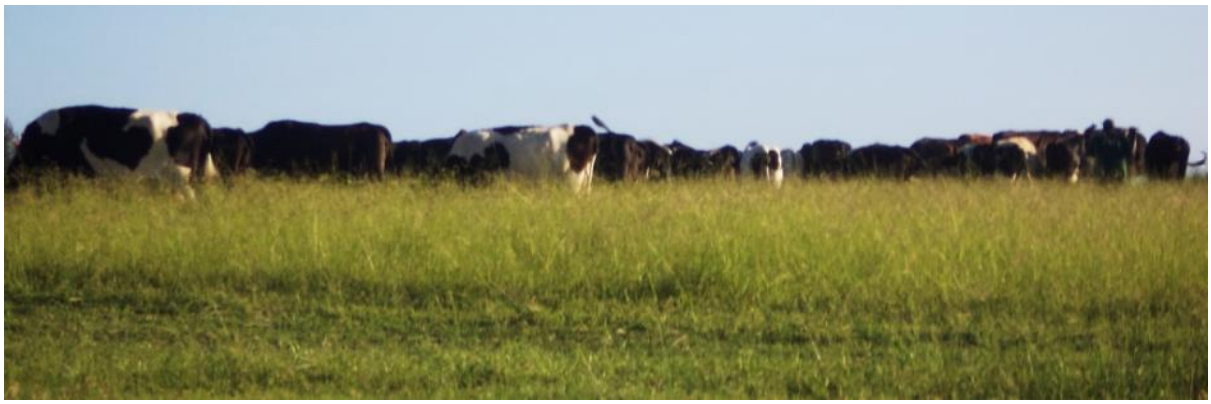
Source: *AWEMAC Field Work 2016*

Plate 3-17: subsistence livestock keeping at the neighbourhood of the proposed development area

3.6.3.5 Large scale dairy farming

Large scale dairy farming was only encountered near point (0588330, 9574324) off Mombasa-Malindi highway. Located at this point and adjacent the sisal plantations, is the Sumra Dairy Farm.

The farm specializes in large scale free range (Plate below) and zero grazing dairy farming. Milk processing and packaging is also done at the farm. Extensive livestock fodder farms lie side by side the sisal plantations. Though the farm will not be affected directly, the spill-over effects of the proposed development will affect the farm positively and negatively. Though the proposed development may expand the market base for dairy products to the farm, noise from construction and operation phases activities of the Master Plan execution may affect the overall productivity of the dairy cows. Excessive noise and vibrations are also known to cause miscarriages among livestock. Dust from construction activities may settle on livestock fodder thereby reducing their photosynthetic capacity and compromising on their productivity. However, it is envisaged that the developer will put in place precautionary measures to minimize the negative impacts. Unless adequate mitigation measures are put in place, the magnitude of the impacts will be moderate.



Source: *AWEMAC Field Work 2016*

Plate 3-18: Free Range Grazing on Fodder Farms at Sumra Dairy Farm Adjacent to the Development Area

3.6.4 Infrastructure Development

This section provides information on the proposed project area infrastructure including roads and drainages, and air strips.

3.6.4.1 Roads and Rail Network Ports and Airports, Airstrips and Jetties

Kilifi County has a road network of 101,000 km (out of which one (1) road is Class A Bitumen Trunk Road of 115.4Kms, one (1) Class A7 Bitumen National Road of 168.6 Kms, five (5) roads Class C Bitumen Primary Roads of 219.3 Kms, Class D gravel Secondary Roads and E earthen minor roads 3,000Kms and the rest unclassified.

The county has about 40km of rail network, which is part of the Mombasa-Kisumu railway stretch that passes through the county between Mazeras and Samburu. There is one station in Mariakani and another railway terminus in the neighboring Mombasa County is about 180km Malindi town.

3.6.4.2 Transport

Kilifi County boasts of two modern bus terminuses in Malindi and Kilifi towns, respectively. There are other middle level bus/matatu Parks in Mariakani and Kaloleni. The construction of Mtwapa ultra-modern bus/Matatu Park in Kilifi South Sub-county is underway. In the future, the county will develop bus/matatu parks at Watamu, Kwachocha, Matsangoni, Tezo, Mavueni and Gongoni. The county is considering construction of marshalling yards for lorries and trucks in the suburb and peri-urban areas of Malindi, Mtwapa, Kilifi and Mariakani towns.

3.6.4.3 Marine Transport

The County has a total of five (5) jetties located at Mtwapa, Kilifi, Ngomeni, Malindi and Takaungu. Ngomeni is another natural harbor in the centre of the coastline with potential to develop as a third port of Kenya and possibly a Special Economic Zone. Potential for another small port is also

found in Kilifi bay, which is currently already being used for water sports with a hotel anchorage. Malindi also has a port that consists of a pier in sound condition, used as a landing site in the unsheltered sea mainly serving the local fish industry.

3.6.4.4 Posts and Telecommunications

The county is covered by all the major mobile telephone service providers such as Airtel Kenya, Safaricom, and Telkom. The county has mobile telephone coverage of 75 percent and minimal usage of landline connection. The county has 7 post offices and 5 sub post offices. The County's major towns are also served by several other courier service providers. The proportion of the population that must travel 5km or more to the nearest post office is 78 percent. There are 70 cyber cafes mostly in the urban areas and thus there is need to prioritize the establishment of digital villages and more cyber cafes in rural areas of the County.

Source: *AWEMAC Field Work 2016*

Plate 3-19 Electricity Lines Serving the development site

3.6.5 Economic analysis

3.6.5.1 Economic activities

The proposed site has a few economic activities going on such as Sisal plantation, real estate business, Cement manufacturing and transport activities such as boda `boda operators, Fishing, Subsistence farming and a few public service vehicles. There is also a dairy farm adjacent to the site (Republic of Kenya, *Kilifi County Integrated Development Plan 2018- 2022*).

3.6.5.2 Employment

The main variable of interest for inequality discussed in the text is work for pay by level of education. The overall literacy rate in Kilifi County stands at 68%. Work for pay is highest in Nairobi at 49% and this is 10 percentage points above the level in Kilifi for those with secondary level of education or above (Republic of Kenya, *First Kilifi County Integrated Development Plan 2018- 2022*).

Although there are anticipated negative impacts such as population influx of workers leading to social challenges such as immoral behaviours, sanitation challenges within neighbouring towns

such as Mtwapa, Malindi and Kilifi. it is expected that positive impact of the proposed Vipingo Mixed Use Development will outweigh the negative. Notably the proposed development will offer job opportunities for males and females including the youth both skilled and unskilled locals in the Kilifi County area. Its anticipated that the master plan implementation stage would generate around 5,000 direct and indirect jobs for Kilifi county and a projection of over 250,000 jobs over a 15-year period. The locals will be employed as casual labourers, and other permanent consultancy and technical staff. Drivers, masons, civil engineers, steel-fixers, welders and other casuals such as carpenters will gain employment. Short-term employment opportunities such as Right of way (ROW) clearance, pit dressing, loading and offloading of construction materials and deliveries, record keeping and provision of security at active sites and temporary campsites and stores will also emerge. Also, there will be some indirect job opportunities such as catering, kiosks (small scale traders), barber shops, which crop up in the areas to service the crew / construction workers. These jobs are expected to improve the economy of the local communities along the area and improve the livelihoods of the local people.

3.6.5.3 Urban and market centers

There are 78 trading Centres in the county with 3,809 registered traders in retail, wholesale and manufacturer. The major ones are; Kilifi, Mtwapa, Malindi, Mariakani and Watamu among others. The wholesalers mostly deal with consumer and hardware products while retail traders, who are in both rural and urban areas, deal mainly with food products. The manufacturers mostly deal in cement such as Rhino Cement Company in Rabai, Mombasa Cement Company in Vipingo, steel products in Mazeras, salt manufacturing by Kensalt and Krystalline Salt in Gongoni and Marereni, commercial starch in Mazeras, power generation in Rabai, soft drinks by Coca Cola and Picana in Mtwapa and Export Processing Zone (EPZ) in Mazeras and Mtwapa (Republic of Kenya, *Kilifi County Integrated Development Plan 2018- 2022*).

3.6.6 Energy

Over 80% of the population in the county relies on wood fuel for their energy needs, a fact that has led to destruction of forests in the county. Access to electricity and solar energy technologies is estimated at 21% and 6% respectively. Those that have access to liquefied petroleum gas and paraffin is estimated at 2% and 8% respectively. According to Kenya National Bureau of Statistics (KNBS) and Society for International Development (SID), 2013, the potential for investment in renewable energy sources (solar and wind) is high. In addition, the Indian Ocean is a potential source of offshore energy. The number of trading Centres connected with electricity is expected to increase as the county continues to implement the Rural Electrification Programme which is aimed at connecting rural Centres with electricity so as to promote wealth and employment creation (Republic of Kenya, *Kilifi County Integrated Development Plan 2018- 2022*).

3.6.7 Housing

Different construction materials are used in building houses in different localities. National Housing Survey (2013) indicates that iron sheets usage for roofing, in Kilifi County, is at 43.7% and that of grass/Makuti is at 53%. Wall construction using stones/blocks/bricks is at 30% and it is mostly in urban areas while mud/ wattle wall construction is at 48%, mostly in rural areas. Most houses, 67%, have earthen floors while 30 % have cemented floors. Housing types are primarily determined by various factors including availability and cost of construction materials, weather and cultural/religious believes in the regions. In the rural areas, houses are simple and small in sizes, generally 1 to 3 rooms per unit. On the other hand, Swahili houses, bungalows, mansionettes and flats are quite common albeit in urban areas. However, presence of shanties is also quite common in the urban areas. (Republic of Kenya, *Kilifi County Integrated Development Plan 2018- 2022*).

Source: *AWEMAC Field Work 2016*

Plate 3-20: Houses Bordering the proposed Development area

3.6.8 Sanitation

Access to basic sanitation facilities remains a formidable challenge across Kilifi county. The county toilet coverage is estimated at 67% while 30% of households have hand washing facilities. A significant proportion of the population in the county has no access to basic sanitation facilities, posing serious public health implications. More importantly, proportion of households with access to sanitation facilities varies across and between major urban centers and peri-urban areas and the concentration of these facilities tends to decline towards the rural areas within the county (Kilifi CIDP 2018-2022).

3.6.9 Mining

The on-going mining activities in the county include cement production in Rabai and Vipingo, Salt extraction in Gongoni and Marereni and sand harvesting and quarrying in the entire county (Kilifi CIDP 2018-2022).

3.6.10 Tourism

Kilifi County is endowed with many tourism attraction sites that includes white sandy beaches in Malindi, Watamu, Kilifi and Mtwapa. Historical sites in Gede, Malindi, Takaungu, Mnarani and Rabai that date back to the slave trade period. Other tourist sites include Kaya forests, Marafa Hell kitchen, Bore Valley, Mekatilili Wa Menza, Kapangani Rock and Sabaki Estuary in Magarini and mangrove swamps that attract both local and international tourists. The county provides good opportunities for sport fishing and marine research especially for rare breading grounds of special fish like Tewa. The county also has the Arabuko Sokoke Forest reserve, Malindi Marine National Park, Watamu Marine National Reserve and Kuruwitu Marine area as major attractions. The Vipingo Ridge golf course and Malindi airport and Kijipwa airstrip are key components of tourism sub-sector (Republic of Kenya, *First Kilifi County Integrated Development Plan 2018-2022*).

3.6.11 Industry

The county has 17 manufacturing industries that include soft drink manufacturing industries in Mtwapa, Salt manufacturing industries in Gongoni and Marereni, Cement manufacturing industries in Rabai and Vipingo and Steel manufacturing industries in Mazeras and Mariakani among others (Republic of Kenya, *First Kilifi County Integrated Development Plan 2018- 2022*). There is also Mombasa Cement Factory bordering the site as shown in the Plate below.

Source: *AWEMAC Field Work 2016*

Plate 3-21: Mombasa Cement Factory Bordering the development area

3.7 Social Cultural Analysis

3.7.1 Cultural changes

The Master plan land is not inhabited apart from sisal workers / settlers of diverse cultural background. The Masterplan area is roughly 30km from Mombasa town hence there are no significant cultural values or changes expected. The most intermittent culture would be the Mijikenda cultural heritage; however, the culture has eroded with time attributed to modernisation. In addition, the neighbouring towns and centres are mainly cosmopolitan hence no significant cultural changes will be expected by the Master plan implementation.

3.7.2 Archaeological and cultural sites

The social cultural analysis did not find any resources of archaeological, paleontological, historical, architectural, and religious (including graveyards and burial sites), aesthetic or other cultural significance resources to be affected. Nevertheless, Vipingo Development Limited will be responsible for "Chance Finds Procedures", in case culturally or archaeological valuable materials are uncovered during excavation. Some key procedures will entail:

i. Stop work immediately following the discovery of any materials with possible archaeological, historical, paleontological, or other cultural value, announce findings to relevant authorities.

ii. Protect artefacts as well as possible use of plastic covers, and implement measures to stabilize the area, if necessary, to properly protect artefacts.

iii. Prevent and penalize any unauthorized access to the artefacts

4 RELEVANT POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

4.1 Introduction

It is a legal obligation within the Laws of Kenya that a master plan of such magnitude adheres to certain legal parameters. This section therefore describes the Policy, Legal, and Institutional framework pertaining to the Vipingo Mixed-Use master plan. The policy, legal and institutional frameworks have been put in place to ensure that such development master plans and projects adhere to environmental conservation. As development activities have the potential to damage the environment, it is a challenge today to ensure that development efforts are sustainable.

There is a growing concern in Kenya and at a global level that many forms of development activities cause damage to the environment and the community. It is part of the Kenyan laws that all Policies Plans and Programmes (PPPs) for implementation shall be subject to Strategic Environmental Assessment. Strategic Environmental Assessment is a useful tool for prevention of negative environmental and social effects of developmental activities. It is now accepted that developments must be economically viable, socially acceptable and environmentally sound.

The proposed Vipingo Mixed-Use master plan was subjected to a comprehensive PPP analysis based on the environmental obligations using a PPP framework, which was developed for the SEA.

4.2 The Constitution of Kenya (2010)

Article 42 of the Kenyan Constitution states: Every person has the right to a clean and healthy environment which includes: -

a) To have the environment protected for the benefit of present and future generations through legislation and other measures, particularly that contemplated in article 69.
b) To have obligation relating to the environment fulfilled under article 70.

Section 69 states that:
The state shall

a) Encourage public participation in the management, protection and conservation of the environment.
b) Establish systems of environmental impact assessment, environmental audit and monitoring of the environment.
c) Eliminate processes and activities that are likely to endanger the environment

Every person has a duty to cooperate with state organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and those of actual resources. It is anticipated that the proposed Vipingo Mixed-Use development will be guided by the spirit of the Kenyan constitution considering environmental protection and conservation.

4.3 Key Policies Relevant to the SEA

4.3.1 National Environmental Policy

The broad objectives of the national environmental policy include;

(i) Optimal use of natural resources while improving environmental quality;
(ii) To conserve resources such that the resources meet the needs of the present without jeopardizing future generations in enjoying the same;
(iii) Develop awareness that inculcate environmental stewardship among the citizenship of the country;
(iv) Integrate environmental conservation and economic activities in the development process;

(v) Ensure that national environmental goals contribute to international obligations on environmental management.

To achieve this, Vipingo Mixed Use Development Plan is anticipated to ensure appropriate reviews and evaluations of developmental plans and operations are checked to ensure compliance with the environmental policy.

4.3.2 The National Housing Policy 2004

The sessional paper no. 3 of 2004 on national housing policy outlines the government of Kenya commitment in provision of affordable housing. The main goal of the policy is to facilitate the provision of adequate shelter and a healthy living environment at an affordable cost to all socio-economic groups in Kenya in order to foster sustainable human settlements. This will minimize the number of citizens living in shelters that are below the habitable living conditions. It will also curtail the mushrooming of slums and informal settlements especially in the major towns. Chapter two of the housing policy outlines one of the objectives of the policy as to promote inclusive participation of the private sector, public sector, community based organisations, Non-Governmental Organisations, co-operatives, communities and other development partners in planning, development and management of housing programmes.

The proposed Vipingo Mixed-Use master plan provides adequate land for medium and high-end residential premises. This provision links very well with the goals and objectives of the national housing policy 2004. Further, in the national housing policy, the government of Kenya commits to facilitate investments in the housing sector. Based on the provisions of the national housing policy 2004, the proposed Vipingo Mixed-Use master plan builds on the government agenda on housing.

4.3.3 The National Industrialization Policy Framework for Kenya 2012-2030

The main objective of the national industrialization policy is to enable the industrial sector to attain and sustain annual sector growth rate of 15% and make Kenya the most competitive and preferred location for industrial investment in Africa leading to high employment levels and wealth creation. Specific objective number 6 of the policy focuses on developing at least 2 Special Economic Zones and 5 SME Industrial Parks.

This specific objective anchors well with the proposed Vipingo Mixed-Use master plan objective on industrial development. Under the master plan, substantial land has been set aside for special economic zones, SME and industrial parks. As such, the proposed Vipingo Mixed-Use contributes greatly to the government efforts on industrialization.

4.3.4 Public Health Policy of 2014-2030

The Kenya Health Policy, 2014–2030 gives directions to ensure significant improvement in overall status of health in Kenya in line with the Constitution of Kenya 2010, the country's long-term development agenda, Vision 2030 and global commitments. It demonstrates the health sector's commitment, under the government's stewardship, to ensuring that the country attains the highest possible standards of health, in a manner responsive to the needs of the population.

This policy is designed to be comprehensive and focuses on the two key obligations of health: realisation of fundamental human rights including the right to health as enshrined in the Constitution of Kenya 2010 and; contribution to economic development as envisioned in Vision 2030.

The public health policy calls upon the individual project proponents within Vipingo Mixed Use Development Plan to ensure that buildings are adequately provided with utilities so that they are fit for human habitation. All developments must have amenities/utilities that are essential for safeguarding public health for all people using the facilities.

4.3.5 HIV/AIDS Policy of 2009

The policy identifies HIV/AIDS as a global crisis that constitutes one of the most formidable challenges to development and social progress. The Pandemic heavily affects the Kenyan economy through loss of skilled and experienced manpower due to deaths, loss of man hours due to prolonged illnesses, absenteeism, reduced performance, increased stress, stigma, discrimination and loss of institutional memories, among others.

Due to the large number of workers who will be involved in the construction and implementation stages of the Vipingo Mixed use Development master plan and the associated social issues with developments of such a scale, HIV/AIDS has been considered as one of the proposed impacts, but adequate mitigation measures have also been proposed to that effect.

4.3.6 Kenya National Policy on Gender and Development (NPGD), 2000

(NPGD), 2000 spells out a policy approach of Gender mainstreaming and empowerment of women and clearly states that it is the right of women, men, girls and boys to participate in and benefit equally from the development process. The NPGD provides a framework for mainstreaming gender in all policies, planning and programming in Kenya and puts in place institutional mechanisms to ensure effective implementation.

Strategies in his policy are informed by and consistent with the objectives of the flagship projects under the social pillar of the Kenya Vision 2030. As per the policy goals, Vipingo Mixed use Development Master Plan envisions a development that seeks a society where women, men, children and persons with disabilities enjoy equal rights, opportunities and a high quality of life.

4.3.7 The Integrated Coastal Zone Management (ICZM) Policy, 2007 & Draft 2013

The ICZM policy is rooted in the understanding that the coastal and marine environment is a limited spatial area and a distinctive system in which a range of environmental and socio-economic interest interconnect in a manner which requires a dedicated and integrated management approach.

The objectives of the policy are to: -

a) Promote integrated planning and coordination of coastal developments across the various sectors;
b) Promote sustainable economic development to secure livelihoods of coastal communities;
c) Conserve the coastal and marine resources and environment for sustainable development;
d) Manage environmental risks associated with changes in shoreline and climate;
e) Develop capacity in research and education and enhance stakeholder awareness and participation in sustainable resource management;
f) Establish effective institutional and legal frameworks for implementation of the ICZM policy.

The policy brings together all those involved in the development, management and use of the coastal zone including developers envisioned by Vipingo Mixed use Development Master Plan to be within a framework that facilitates the coordination and integration of activities and decision-making processes.

4.3.8 The Regional Development Authorities Policy, 2007

This policy calls for equitable socio-economic development through the sustainable use of natural resources by formulating integrated regional development plans in consultation with all those

involved, closing gaps in regional resource mapping and attracting resource-based investment that benefit communities.

Vipingo Mixed use Development Master Plan links with the goals of the policy in the framework for streamlining and strengthening the Coast Development Authority (CDA), Tana, and Athi Rivers Development Authority (TARDA) in coastal zone development and management.

4.3.9 The National Oceans and Fisheries Policy, 2008

The policy is rooted in the provisions of the Convention on the Law of the Sea (1982), the Maritime Zones Act (1989) Section 5 and the Presidential Proclamation of June 2005. It affirms Kenya's sovereignty over the exploration, exploitation, conservation and management of ocean resources. It focuses on resource management in territorial waters and the Exclusive Economic Zone (EEZ).

Vipingo Mixed use Development Master Plan addresses aspects of local fisheries management and development, including environmental conservation, regional cooperation, research, surveillance and monitoring, social responsibility and governance.

4.3.10 The Sessional Paper No.4 on Energy, 2004

The Sessional Paper No.4 on Energy of Kenya's vision is to promote equitable access to quality energy services at the least cost while protecting the environment and thus it does recognize the importance of harnessing and utilizing solar energy.

Vipingo Mixed use Development Master Plan recognizes the great potential of this source of energy and encourages the development and utilization of appropriate technologies by respective developers in attaining its vision.

4.3.11 The National Climate Change Response Strategy (NCCRS), 2010

The purpose of this strategy is to put in place robust measures needed to address most of the challenges posed by climate variability and change through thorough impact assessments and monitoring of various projects. According to Climate Change Projections, in this country we are likely to experience hotter drier sunny seasons, warmer wetter rainy seasons, rise in sea levels and an increase in extreme weather events. These climatic changes will impact on our daily lives and the buildings that we work and live in must be adapted to cope with such changes. With time, both existing buildings and the construction of new buildings will have to adapt to cope with the conditions climate change may produce. A range of new ways to design, construct, upgrade and occupy buildings so that they are more energy efficient as well as resilient to threats such as flooding and drought is proposed.

Vipingo Mixed use Development Master Plan key goals on align with the NCCRS on priority inclusion of energy efficient innovations and technologies, and utilization of low-carbon appliances and tools; the utilization of eco-friendly energy resources such as solar as well as possible utilization of Non-motorized Transport facilities.

4.3.12 Sessional Paper No. 3 of 2009 on National Land Policy

This Sessional Paper has been formulated to provide an overall framework and define the key measures required to address the critical issues of land administration, access to land, land use planning, restitution of historical injustices, environmental degradation, conflicts, unplanned proliferation of informal urban settlements, out-dated legal framework, institutional framework and information management. The Sessional Paper designates all land in Kenya as Public, Community or Private.

Most significantly, Vipingo Mixed use Development Master Plan recognizes and Public and Private land rights through physical planning act. It also recognizes and protects private land rights and provides for derivative rights from all categories of land rights holding.

4.3.13 Sessional Paper, No. 1 of 2017 on National Land Use Policy

This policy has been developed, incorporating all activities that are likely to have an impact on the use of land and its resources. The overall goal of the national land use policy is to provide legal, administrative, institutional and technological framework for optimal utilization and productivity of land related resources in a sustainable and desirable manner at national, county and community levels. Key principles informing the policy include efficiency, access to land use information, equity, elimination of discrimination and public benefit sharing.

Vipingo Mixed use Development Master Plan is premised on the philosophy of economic productivity, social responsibility, environmental sustainability.

4.3.14 Kenya Environmental Sanitation and Hygiene Policy 2016 – 2030

The Kenya Environmental Sanitation and Hygiene Policy (KESHP) 2016-2030 provides broad guidelines to both state and non-state actors at all levels to work towards universal access to improved sanitation leading to improved quality of life for the people. Primarily, KESHP aims to increase the proportion of the population with access to improved sanitation to 100 percent by 2030 and ensure a clean and healthy environment for all in Kenya.

Vipingo Mixed use Development Master Plan just like KESHP proposes a range of complementary activities including the provision of sanitation services and maintenance of sanitary facilities for proper collection, treatment and environmentally sound disposal of liquid and solid wastes, water treatment and safety, promotion of hygiene practices, public education, sanitation marketing, regulation and research and development.

4.4 Institutional Framework

The SEA process extends the aims and principles of Environmental Impact Assessment (EIA) upstream in the decision-making process. Section 57A of EMCA (Cap 387) and Environmental (Impact Assessment and Audit) Regulations, 2003 recognizes SEA as a measure of environmental impact assessment at strategic level such as policy, plans and programmes. EMCA (CAP 387) Section 57a requires all Policies, Plans and Programmes for implementation to be subjected to Strategic Environmental Assessment. The Regulations section 42 and 43 address Strategic Environment Assessment; section 42(1) requires Lead Agencies in consultation with NEMA to subject all policy, plans and programmes for implementation to a Strategic Environment Assessments. Regulation 42(3) commits the government and all Lead agencies to incorporate principles of SEA in the development of sector or national policy.

4.4.1 Key National Institutions and Departments

At present there are over twenty (20) institutions and departments under the umbrella of different ministries albeit others being semi-autonomous, which deal with environmental issues in Kenya. Some of the key institutions which are relevant to the proposed Vipingo Mixed Use Development include;

i. National Environment Management Authority (NEMA),
ii. Kenya Forestry Service (KFS),
iii. Kenya Wildlife Service (KWS),
iv. Water Resources Authority (WRA)

4.4.1.1 Ministry of Water and Sanitation

Strategic functions of the Ministry of Water and Sanitation include;

- Accelerating the implementation of water sector reforms;
- Improving the sustainable management of water resources;
- Improving the provision of water and sewerage services;
- Improving utilization of land through irrigation and land reclamation;

- Strengthening institutions in the Ministry and the water sector;
- Mobilizing resources and promoting efficiency in their utilization; Improving the management and access to water resources information.

4.4.1.1.1 National Water Conservation and Pipeline Corporation

The National Water Conservation and Pipeline Corporation (NWCPC) was established under the State Corporation's Act Chapter 446 of the Laws of Kenya as an autonomous agency. NWCPC overall goal is to enhance social and economic wellbeing of all Kenyans through improved access; availability and reliability of water supply. The long-term objectives are to seek to bridge the gap between the demand and supply of water which is in line with Kenyan Constitution and Vision 2030. The main objectives of the corporation is to develop state schemes and spearhead dam construction for water supplies, flood control and other multi-purpose uses; land drainage and construction of dykes; Carry out groundwater recharge using flood water; Develop, retain existing and expand bulk water supply to Water Service Boards and other Water Service Providers.

4.4.1.1.2 Water Resources Authority (WRA)

Water Resources Authority (WRA) is a state corporation established under Section 11 of the Water Act, 2016. Pursuant to Section 6 of the Act, the Authority is an Agent of the National Government responsible for regulating the management and use of water resources. The Water Act, 2016 makes extensive provisions on the Authority's role in regulating the use and management of water resources. WRA was operationalized on 21st of April 2017, vide Gazette Notice No. 59. However, the Authority has been in existence for 12 years following its establishment under the Water Act, 2002 as Water Resources Management Authority (WRMA). WRA will provide the necessary borehole and water extraction permits from local streams.

4.4.1.2 Ministry of Environment and Natural Resources

The Ministry was established and mandated to undertake protection, conservation and development of environment and natural resources to ensure sustainable development. Semi-Autonomous Government Agencies under the Ministry of Environment and Natural Resources include:

i. National Environment Management Authority (NEMA)
ii. Kenya Water Towers Agency (KWTA)
iii. Kenya Wildlife Service (KWS)
iv. Kenya Forest Service (KFS)
v. Kenya Forest Research Institute (KEFRI)

4.4.1.2.1 National Environment Management Authority (NEMA)

NEMA is a semi-autonomous agency under the Ministry of Environment, established to exercise general supervision and co-ordinate over all matters relating to the environment and to be the principal instrument of the government in the implementation of all policies relating to the environment. The Director General appointed by the president heads NEMA. Any project that falls under the second schedule of EMCA, Cap 387 shall seek an Integrated Environmental Impact Assessment Licence from NEMA.

4.4.1.2.2 Kenya Wildlife Service (KWS)

KWS is a state corporation that was established by an Act of Parliament (Cap 376), now repealed by Wildlife Conservation and Management Act (2013), with the mandate to conserve and manage wildlife in Kenya, and to enforce related laws and regulations. KWS undertakes conservation and management of wildlife resources across all protected areas systems in collaboration with

stakeholders. KWS goal is to work with others to conserve, protect and sustainably manage wildlife resources.

4.4.1.3 Ministry of Labour and social development

The mandate of the ministry is "formulation, review and implementation of employment, national human resource planning and development, national labour productivity, Facilitating and Tracking Employment creation, Co-ordination of National employment, Internship and Volunteers for public service, Community Development, Protection and advocacy of needs of Persons with Disabilities, and Workplace Inspection and Workman's Compensation. The Labour Department is the Ministry's focal point agency responsible for implementation of the three major Labour Laws; namely: The Employment Act, 2007; The Labour Institutions Act, 2007; and The Labour Relations Act, 2007.

4.4.1.3.1 Directorate of Occupational Safety and Health Services (DOSHS)

The Directorate of Occupational Safety and Health Services (DOSHS) is one of departments within the Ministry of Labour and social protection, whose primary objective is to ensure safety, health and welfare of all workers in all workplaces. Unsafe and unhealthy work environment causes accidents, diseases, disasters and environmental pollution that occasion huge economic and social burdens to individuals and enterprises thereby stifling economic and social growth.

4.4.2 Kenya Marine and Fisheries Research Institute (KMFRI)

Kenya Marine and Fisheries Research Institute (KMFRI) is a State Corporation established in 1979 by the Science and Technology Act, Cap 250 of the Laws of Kenya, which has since been repealed by the Science, Technology and Innovation Act No. 28 of 2013 which has recognized KMFRI as a national research institution under section 56, fourth schedule. KMFRl's mandate is to undertake research in "marine and freshwater fisheries, aquaculture, environmental and ecological studies, and marine research including chemical and physical oceanography", in order to provide scientific data and information for sustainable exploitation, management and conservation of Kenya's fisheries and other aquatic resources, and contribute to National strategies of food security, poverty alleviation, clean environment and creation of employment as provided for under Vision 2030.

4.4.3 Institutions under EMCA Cap 387

There are other institutional arrangements provided for within the EMCA Cap 387 and relevant to the developments envisioned in the Master Plan. The roles are reviewed and discussed into details below:

4.4.3.1 National Environmental Tribunal

The National Environment Tribunal (NET) created under Section 125 of EMCA Cap 387 has the following functions:

- To hear and determine appeals from NEMA's decisions and other actions relating to issuance, revocation or denial of (EIA) licences or amount of money to be paid under the Act and imposition of restoration orders;
- To give direction to NEMA on any matter of complex nature referred to it by the Director General; and

If the proponent disagrees with NEMA decisions in exercising the above-mentioned functions, then they may lodge a case at the NET to seek to overturn the decision. Should this avenue not lead to a favourable ruling from the NET, an appeal may be lodged in the Environment and Land Court.

The Environment and Land Court as one of the Courts contemplated by article 162(2) is a Superior Court just like its counterpart, the Industrial Court. Both have the same status as the High Court. It has jurisdiction to hear any other dispute relating to environment and land.

4.4.3.2 National Environmental Complaints Committee

The National Environmental Complaints Committee performs the following functions:

- Investigate any allegations or complaints against any person or against the authority in relation to the condition of the environment in Kenya and on its own motion, any suspected case of environmental degradation and to make a report of its findings together with its recommendations thereon to the Cabinet Secretary.
- Prepare and submit to the Cabinet Secretary periodic reports of its activities which shall form part of the annual report on the state of the environment under section 9 (3) and
- To undertake public interest litigation on behalf of the citizens in environmental matters.

This committee will act as a safeguard for members of the public who feel aggrieved by actions taken under the proposed development and can exercise their constitutional rights to launch a complaint should they have exhausted all other grievance redress mechanisms available to them.

4.4.3.3 National Environment Action Plan Committee

The Authority is responsible for the development of a 6-year National Environment Action plan and shall ensure that it has undertaken public participation before the adoption of the plan. The National Environment Action Plan shall:

- Contain analysis of the Natural Resources of Kenya with an indication as to any pattern of change in their distribution and quantity over time.
- Contain analytical profile of the various uses and value of the natural resources incorporating
- Considerations of intergenerational and intra-generational equity.

4.4.3.4 County Environment Committees

Governors shall by notice in the gazette constitute a County Environment Committee that shall be responsible for the proper management of the environment within the County for which it is appointed. They should also perform such additional functions as prescribed by the Act or as may, from time to time be assigned by the Governor by notice in the gazette. Every County Environment Committee shall, within one year of the commencement of this EMCA CaP 387 and every five years thereafter, prepare a county environment action plan in respect of the county for consideration and adoption by the County Assembly. In preparing a County Environment Action Plan, County Environment Committee shall undertake public participation and take into consideration every other county environment action plan already adopted with a view to achieving Consistency among such plans. purpose of environmental action plans is to co-ordinate and harmonise the environmental policies, plans, programmes and decisions of the national and county governments, as the case may be, in order to—

- Minimize the duplication of procedures and functions; and promote consistency in the exercise of functions that may affect the environment; and
- Secure the protection of the environment across the country; and
- Prevent unreasonable actions by any person, state organ or public entity in respect of the environment that are prejudicial to the economic or health interests of other counties or the country.

The decisions of these committees are legal and it is an offence not to implement them.

4.4.3.5 National Environment Trust Fund (NETFUND)

The trust fund is vested in NEMA and subject to EMCA Cap 387. A board of five trustees appointed by the Cabinet Secretary administers it. These funds may be received from donations, endowments, grants and gifts from whatever source or sums of money or from monies designated by NEMA for this fund.

4.5 Legal Framework / Laws

There are several legal provisions on environmental protection, which touch on and regulate the development of projects like Vipingo Mixed Use Development. A summary of the various legislations relevant to the development is given hereunder. The following pieces of legislations are applicable to the proposed Vipingo Mixed Use Development.

4.5.1 Environmental Management and Co-ordination Act (EMCA) Cap 387

This Act aims at coordinating environmental protection activities in the country. In its preamble, the Act states that every person in Kenya has a right to a clean and healthy environment. The Act defines the legal and administrative co-ordination of the diverse sectorial initiatives in the field of environment. The Act harmonizes the sector specific legislations touching on the environment in a manner designed to ensure greater protection of the environment. This Act is guided Policy wise by the National Environmental Council, while the day-to-day enforcement falls under the Director General of the National Environment Management Authority.

The Environmental Management and Coordination Act (EMCA) CAP 387 provides for the legal framework for the management of the Kenyan environment. Under the act, section 57A, all Policies, Plans and Programmes for implementation shall be subject to a Strategic Environmental Assessment. It further states that for the avoidance of doubt, the plans, programmes and policies are those that are either subject to preparation or adoption by an authority at regional, national, county or local level, or which are prepared by an authority for adoption through a legislative procedure by Parliament, Government or if regional, by agreements between the governments or regional authorities, as the case may be or determined by the Authority as likely to have significant effects on the environment. For the Vipingo Mixed-Use Master Plan the later applies.

The Act further states that all entities shall undertake or cause to be undertaken the preparation of strategic environmental assessments at their own expense and shall submit such assessments to the Authority for approval. The Authority shall, in consultation with lead agencies and relevant stakeholders, prescribe rules and guidelines in respect of Strategic Environmental Assessments.

In Section 55 (8) it states that where any polluting or hazardous substances are discharged, released or in any other way escape into the Coastal Zone, any person responsible for management of the polluting or hazardous substances shall be liable—

a) for any resultant damage; and
b) for the cost of any measures reasonably taken after the release or escape for the purpose of preventing, reversing or minimising any damage caused by such discharge, release or escape; and
c) for any damage caused by any measures so taken.

Section 55 (9) states that where there arises a grave and imminent threat or danger of damage of discharge, release or escape of polluting or hazardous substances into the Coastal Zone, any person responsible for management of the polluting or hazardous substances shall be liable—

a) for the cost of any measures reasonably taken for the purpose of preventing, minimising or controlling any such damage; and
b) for any damage caused by any measures so taken.

Section 75 of the Act requires an entity operating a sewerage system or owner or operator of any trade or industrial undertaking to not discharge any effluents or other pollutants into the environment without an effluent discharge licence issued by the Authority.
This SEA report is submitted to NEMA in the prescribed form, and seeks to ensure the following;

- *The sustainable use of natural resources,*
- *The enhanced protection and conservation of biodiversity,*
- *Interlinkage of human settlement and cultural issues,*
- *Integration of socio-economic and environmental factors,*

- *The protection and conservation of natural physical surroundings of scenic beauty.*

Under the act, all proposed projects that are likely to have significant impact on the environment according to the Second Schedule will undergo an Environmental Impact Assessment (EIA). According to section 58 of the Act, second schedule, and the environmental (Impact Assessment and Audit) Regulations, 2003, all new enterprises and projects must undergo EIA. The independent developments under the proposed masterplan will therefore be subjected to EIA. Notably , under EMCA CAP 387, there are a number of regulations geared towards sustainable development. The applicable regulation to the proposed Vipingo Mixed-Use Masterplan are discussed below:

4.5.1.1 Environmental Management and Co-ordination (Environmental Impact Assessment and Audit) Regulations, 2003

Under these regulations, it is stated that no licensing authority under any law in force in Kenya shall issue a trading, commercial or development permit or license for any micro project activity likely to have cumulative significant negative environmental impact before it ensures that a strategic environmental plan encompassing mitigation measures and approved by the Authority is in place.

Section 42 and 43 address Strategic Environment Assessments; section 42(1) requires lead agencies in consultation with NEMA to subject all policy, plans and programmes for implementation to a Strategic Environment Assessments while regulation 42 (3) commits the government and all lead agencies to incorporate principles of SEA in the development of sector or national policy. Therefore the SEA for Vipingo Mixed Use Development Masterplan is in compliance to this regulation.

4.5.1.2 Environmental Management and Coordination (Water Quality Regulations) 2006

Water Quality Regulations apply to water used for domestic, industrial, agricultural, and recreational purposes; water used for fisheries and wildlife purposes, and water used for any other purposes. Different standards apply to different modes of usage. These regulations provide for the protection of lakes, rivers, streams, springs, wells and other water sources. The objective of the regulations is to protect human health and the environment. The effective enforcement of the water quality regulations will lead to a marked reduction of water-borne diseases and hence a reduction in the health budget.

The regulations also provide guidelines and standards for the discharge of poisons, toxins, noxious, radioactive waste or other pollutants into the aquatic environment in line with the Third Schedule of the regulations. The regulations have standards for discharge of effluent into the sewer and aquatic environment. While it is the responsibility of the sewerage service providers to regulate discharges into sewer lines based on the given specifications, NEMA regulates discharge of all effluent into the aquatic environment.

Everyone including the developers implementing the Vipingo Mixed Use Development Master Plan are required to refrain from any actions, which directly or indirectly cause water pollution, whether or not the water resource was polluted before the enactment of the Environmental Management and Coordination Act (EMCA) Gazetted in 1999. The developers are also expected to ensure compliance to the regulations.

4.5.1.3 Environmental Management and Co-ordination (Waste Management Regulations) 2006

The Minister for Environment and Natural Resources gazetted these regulations in 2006. These Regulations may be cited as the Environmental Management and Co-ordination (Waste Management) Regulations, 2006. Waste Management Regulations are meant to streamline the handling, transportation and disposal of various types of waste. The aim of the Waste Management Regulations is to protect human health and the environment. Currently, different types of waste are dumped haphazardly posing serious environmental and health concerns.

The Act provides for how waste should be handled from transportation to disposal. It also includes provisions that waste should be transported by licensed transporters to licensed disposal facilities. The regulations place emphasis on waste minimization, cleaner production and segregation of waste at source. Implementation of Vipingo Mixed use Development Master Plan is therefore expected to ensure compliance to the waste management regulations 2006.

4.5.1.4 Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations, 2009

These Regulations determine that no person or activity shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise that annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. In determining whether noise is loud, unreasonable, unnecessary or unusual, the following factors may be considered:

- Time of the day;
- Proximity to residential area;
- Whether the noise is recurrent, intermittent or constant;
- The level and intensity of the noise;
- Whether the noise has been enhanced in level or range by any type of electronic or mechanical means; and,
- Whether the noise is subject to be controlled without unreasonable effort or expense to the person making the noise.

These regulations also relate noise to its vibration effects and seek to ensure no harmful vibrations are caused by controlling the level of noise. During the implementation of the Vipingo Mixed use Development Master Plan, the developers intending to undertake activities in which noise is suspected to be injurious or endangers the comfort, repose, health or safety of others and the environment, must make an application to NEMA and acquire a license subject to payment of requisite fees and meeting the license conditions. Failure to comply with these regulations attracts penalties as prescribed under these regulations.

4.5.1.5 Environmental Management and Co-ordination (Air Quality) Regulations, 2014

The objective of this Act is to provide for prevention, control and abatement of air pollution to ensure clean and healthy ambient air. It provides for the establishment of emission standards for various sources, including mobile sources (e.g. motor vehicles) and stationary sources (e.g. industries) as outlined in the Environmental Management and Coordination Act, CAP 387. It also covers any other air pollution source as may be determined by the Cabinet Secretary for Environment, Water and Natural Resources in consultation with the Authority. Emission limits for various areas and facilities have been set.

Implementers of Vipingo Mixed use Development Master Plan will need to ensure that all envisioned developments are in line with regulations. Various land use plans such as industrial and residential have been meticulously zoned for ease of air quality management plan.

4.5.1.6 The Environmental Management and Co-ordination (Conservation and Management of Wetlands) Amendment Regulations, 2017

This Act applies to all wetlands in Kenya whether occurring in private or public land. It contains provisions for the utilization of wetland resources in a sustainable manner compatible with the continued presence of wetlands and their hydrological, ecological, social and economic functions and services.

The objectives of these Regulations include-

a) to provide for participatory conservation of wetlands and their resources in Kenya;
b) to promote the integration of wise-use of resources in wetlands into the local, county, and national management of natural resources for, ecological, aesthetic, cultural and socio-economic development;

c) to ensure the protection of the diversity of wetland habitats, flora and fauna;
d) to promote awareness creation, education, research, indigenous knowledge and partnerships with other relevant institutions in the management of wetland ecosystems;
e) to prepare and maintain an up-to-date inventory and database of wetlands and wetland resources, for prioritisation of relevant interventions;
f) to protect wetlands within river basins, lake basins and coastal zones from pollution including siltation, agricultural and infrastructural developments, overexploitation, alien and invasive species, and other activities likely to degrade the wetland ecosystem.

Part II Section 10 of these regulations state that every person shall refrain from any act which directly or indirectly causes, or may cause immediate or subsequent water pollution. That no person shall throw or cause to flow into or near a wetland any liquid, solid gaseous or any other hazardous substance or deposit any such substance in or near it, as to cause pollution.

Vipingo Mixed use Development Master Plan is in synergy with the regulation, the individual projects envisioned by the plan will be subject to approved standard procedures including carrying out an Environmental Impact Assessment in accordance with the provisions of the Act (EMCA) where developers intends to carry out drainage; conversion; burning; alteration of a wetland and wetland resources; introduction of alien and invasive species; or extraction of wetland resources through sand mining.

4.5.1.7 The Environmental Management and Co-Ordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations, 2006

Kenya has a large diversity of ecological zones and habitats including lowland and mountain forests, wooded and open grasslands, semi-arid scrubland, dry woodlands, and inland aquatic, and coastal and marine ecosystems. In addition, a total of 467 lake and wetland habitats are estimated to cover 2.5% of the territory. In order to preserve the country's wildlife, about 8% of Kenya's land area is currently under protection.

The country has established numerous goals, as well as general and specific objectives that relate to these issues, among others: environmental policies and legislations; involvement of communities; documentation of national biological resources; sustainable management and conservation of biodiversity; fair and equitable sharing of benefits; technical and scientific cooperation; biodiversity assessment; dissemination of information; institutional and community capacity building; and integration of biodiversity concerns into development planning.

Vipingo Mixed use Development Master Plan is in synergy with the regulation as the plan aims to ensure conservation of biological diversity. All projects envisioned by the master plan will be expected to undertake an Environmental Impact Assessment License issued by the Authority under the Act.

4.5.1.8 Environmental Management and Co-Ordination (Controlled Substances) Regulations, 2007

The Controlled Substances Regulations defines controlled substances and provides guidance on how to handle them. This regulation mandates NEMA to monitor the activities of persons handling controlled substances, in consultation with relevant line ministries and departments, to ensure compliance with the set requirements. Under these regulations, NEMA has a list of controlled substances and the quantities of all controlled substances imported or exported within a period. The list indicates all persons holding licenses to import or export-controlled substances, with their annual permitted allocations.

The regulations stipulate that controlled substances must be clearly labelled with among other words, "Controlled Substance-Not ozone friendly'') to indicate that the substance or product is harmful to the ozone layer. Advertisement of such substances must carry the words, "Warning: Contains chemical materials or substances that deplete or have the potential to deplete the ozone layer."

Vipingo Mixed use Development Master Plan is in synergy with the regulation as any developments that aim to producer and/or importer-controlled substances will be required to include a material safety data sheet. Developers that intend to manufacture, export or import controlled substances will require to be licensed by NEMA. Further, any person wishing to dispose of a controlled substance must be authorized by NEMA. The licensee should ensure that the controlled substance is disposed of in an environmentally sound manner. These regulations also apply to any person transporting such controlled substances through Kenya. Such a developer will be required to obtain a Prior Informed Consent (PIC) permit from NEMA.

4.5.1.9 The Environmental (Prevention of Pollution in Coastal Zone and other Segments of the Environment) Regulations, 2003

Section 3 of these regulations state that no ship or any other person in Kenya shall be allowed to discharge any hazardous substance, chemical, oil or oily mixture into the territorial waters of Kenya or any segment of the environment contrary to the provisions of these Regulations.

Vipingo Mixed use Development Master Plan anchored on sustainability and green initiatives hence aimed at Prevention of Pollution in Coastal Zone and other Segments of the Environment.

4.5.2 Water Act, 2016

The Water Act, 2016 provides the legal framework for the management, conservation, use and control of water resources and for the acquisition and regulation of right to use water in Kenya. It also provides for the regulation and management of water supply and sewerage services. In general, the Act gives provisions regarding ownership of water, institutional framework, national water resources, management strategy, and requirement for permits, state schemes and community projects. Part IV of the Act addresses the issues of water supply and sewerage. Specifically, section 59 (4) of the Act states that the national water services strategy shall contain details of:

- Existing water services
- The number and location of persons who are not being provided with basic water supply and basic sewerage
- Plans for the extension of water services to underserved areas
- The time frame for the plan; and
- An investment programme

Part II, section 18, of the Water Act 2016 provides for national monitoring and information system on water resources. Following on this, sub-section 3 allows the Water Resources Authority (WRA) to demand from any person or institution, specified information, documents, samples or materials on water resources.

Developments envisioned by Vipingo Mixed use Development Master Plan will require to keep water use consumption for monitoring purpose and as part of legal compliance to the regulations. Water sources such as boreholes and wells will be expected to undertake EIA and seek WRA approval as the authority is liable for management, conservation, use and control of water resources.

4.5.3 The Energy Act, 2019

The energy Act aims to consolidate the laws relating to energy, to provide for National and County Government functions in relation to energy, to provide for the establishment, powers and functions of the energy sector entities; promotion of renewable energy; exploration, recovery and commercial utilization of geothermal energy; regulation of midstream and downstream petroleum and coal activities; regulation, production, supply and use of electricity and other energy forms; and for connected purposes

The Act establishes the Energy and Petroleum Regulatory Authority to ensure generation, importation, exportation, transmission, distribution, supply and use of electrical energy except for licensing of nuclear facilities. Article 177 of the Act gives liability to the transmission licensee to make compensation to the owner or occupier of any land or the agents, workmen or servants of the owner or occupier of any land which is the subject of the provisions of this Act, for damage or loss caused by the exercise or use of any power or authority conferred by this Act or by any irregularity, trespass or other wrongful proceeding in the execution of this Act or by the loss or damage or breaking of any energy infrastructure or by reason of any defect in such infrastructure. Article 178 of the act gives provisions for installation of energy infrastructure along roads, and railways, government property, including forests, National parks, reserves, and heritage sites, for the purpose of the production, conveyance and supply of energy. Article 179, gives the Cabinet Secretary compulsory acquisition of land for purposes of constructing, modifying or operating any energy infrastructure or for incidental purposes where reasonable attempts to acquire the land had failed.

The implementer of Vipingo Mixed use Development Master Plan should ensure close linkage with the County Government of Kilifi as they have power to ensure efficient use of energy and its conservation. All developments envisioned by the masterplan are expected to protect health and safety of users of energy by providing an enabling environment of operation that protects the health and safety of users of the service for which the license or permit is required and other members of the public affected by the undertaking.

4.5.4 Forest Conservation and Management Act, No. 34 of 2016;

The Forest Conservation and Management Act, 2016 gives effect to Article 69 of the Kenyan 2010 Constitution about forest resources; to provide for the development and sustainable management, including conservation and rational utilization of all forest resources for the socio-economic development of the country and for connected purposes. The Act applies to all forests on public, community and private lands. The principles of the Act lay emphasis on (a) good governance in accordance with Article 10 of the Constitution; (b) public participation and community involvement in the management of forests; (c) consultation and co-operation between the national and county governments; (d) the values and principles of public service in accordance with Article 232 of the Constitution; (e) protection of indigenous knowledge and intellectual property rights of forests resources; and (f) international best practices in management and conservation of forests.

Further, the act forms the baseline to develop a national forest policy and formulate a public forest strategy for the sustainable use of forests and forest resources. In addition, the Act, establishes the Kenya Forest Service to conserve, protect and manage all public forests in accordance with the provisions of this Act.

The land uses envisioned by Vipingo Mixed use Development Master Plan affects patches of privately owned farm and urban forests. It is appropriate to ensure initiation of participatory forest management in the green spaces envisioned by the masterplan so that the local community can have a significant input with Kenya Forest Service (KFS) office playing a coordination role. Further, the

master plan land uses will need to ensure that disruption of the environment in forested areas is minimised and appropriate mitigation strategies are established and implemented.

4.5.5 Climate Change Act, 2016

The Act provides for a regulatory framework for enhanced response to climate change; to provide for mechanism and measures to achieve low carbon climate development, and for connected purposes.
Part IV Section 16 states that the Council may, in consultation with the Cabinet Secretary and relevant State Departments, impose climate change obligations on private entities, including entities constituted under the Public Benefits Organizations Act, 2013.

Vipingo Mixed use Development Master Plan is anchored on sustainability and green initiatives which will be critical to ensure climate change mitigation and adaptation. All developments envisioned by the plan will be anticipated to be climate resilient to extreme temperatures or precipitation.

4.5.6 Maritime Zones Act (Cap 371)

This act is one of the statutes, which has been enacted by Kenya for application to territorial waters and the continental shelf. The Act is meant to provide for the delimitation of the exclusive economic zone of Kenya. It is also meant to provide for the exploration conservation and management of the resources of the maritime zones. Section 5 of the Act provides for Kenya's sovereignty with respect to the exploration, conservation and management of the resources in the zone. Section 9(1) (b) specifically mandates the minister to make regulations for prescribing measures for the protection and preservation of the marine environment.

Vipingo Mixed use Development Master Plan is in synergy with the Maritime zones Act. The plan has ensured adequate protection of the beachfront. It is anticipated that the mixed-use development will be a key stakeholder in protection of remnants of degraded mangrove forests. The beach will be critical as a commercial area for fishermen and also recreational zone for the residents within the development. It is anticipated that the beach will be getaway to the neighbouring small ports of Malindi, and Kilifi and possible linkage to the major Ports of Mombasa and the envisioned Lamu Port.

4.5.7 Coast Development Authority Act (Cap 449)

This act was enacted in 1992 and revised in 2012 with the sole aim of providing for the establishment of an authority to plan and coordinate the implementation of development projects in the whole of the Coast province and in the exclusive economic zone. The jurisdiction of the Coast Development Authority covers any part of the Coast province within Lamu, Mombasa, Malindi, Kilifi, Tana River, Kwale and Taita Taveta districts including the southern half of Garissa district and the exclusive economic zone.

The principal function of the Coast Development Authority is to oversee the implementation of sustainable projects and development within its areas of jurisdiction. Vipingo Mixed use Development Master Plan is in line with goals of the Coast Development Authority for long range development plans for the area.

4.5.8 Kenya Ports Authority Act

The Act of Parliament provides for the establishment of an Authority to be known as the Kenya Ports Authority (KPA), for the transfer to the Authority of the undertakings, within Kenya, of the East African Harbours Corporation, for the functions of the Authority. KPA has power (a) to maintain, operate, improve and regulate the ports (b) to construct, operate and maintain beacons

and other navigational aids; (c) to construct new ports; (d) to carry on the business of stevedore, wharfinger or lighterman; (e) to act as warehousemen and to store goods whether or not such

goods have been or are to be handled as cargo or carried by the Authority; (f) to the extent determined by the Minister, to act as carriers of goods or passengers by land or sea; (g) to consign goods on behalf of other persons to any places whether within Kenya or elsewhere; (h) to provide such amenities or facilities for persons making use of the services performed or the facilities provided by the Authority as may appear to the Board necessary or desirable.

KPA manages the Port of Mombasa which is the key entry and exit point for cargo belonging to a vast hinterland that include Kenya, Uganda Rwanda, Burundi, Democratic Republic of Congo, Tanzania, South Sudan, Somalia and Ethiopia. The KPA is responsible for the port of Mombasa and today's coastal small ports such as Funzi, Shimoni and Vanga located in the south coast, Mtwapa, Kilifi, Malindi, Lamu and Kiunga further north. Notably most of the KPA ports are within the confines and accessibility to the proposed Vipingo Development limited. Most significant and in close proximity to the development include the envisioned small ports of Kilifi, and Malindi.

Kilifi has a beautiful bay approximately kilometres to Vipingo Mixed use Development which is currently already used for water sports with a hotel anchorage. The jetty also handles fish at approximately 260MT per year, with marina facilities for tourists. The area is naturally sheltered with a bridge of 17m vertical clearance. This site is ideally positioned to develop as a high-end marina. KPA is planning to build a jetty for fish landing, a Luxury Marina building with toilets and washing area, a Harbor Master office, and 200 mooring points for the various types of vessels. The Malindi Port is situated in Malindi town 120 km north of Mombasa and approximately 80 Kms to Vipingo Mixed Use Development. The Port consists of a pier which is in a sound condition and I t is used as a landing site in the unsheltered sea mainly to serve local fish industry. However, as a result of accretion, the breaking zone has shifted to the pier's fish landing site. KPA is planning to develop the pier to enable proper fish and tourists landing port, considering that Malindi is a tourist city. There is a jetty for fish landing on the beach handling approximately 1,250MT per year and 8000 tourist boat moves. KPA intends to acquire 2,500 sqm of land for port development. They will build offices, fish cold store and ice making facilities, boat repair facilities fuel shop and tourist offices. There will also be a floating pontoon.

Vipingo Mixed Use Development masterplan preserved the beach front meant for public use and to support the local fishermen. The beach will be critical as a commercial area for fishermen and also recreational zone for the residents within the development. It is anticipated that the beach will be getaway to the neighbouring small ports of Malindi, and Kilifi and possible linkage to the major Ports of Mombasa and the envisioned Lamu Port.

4.5.9 The Agriculture, Fisheries and Food Authority Act of 2013

The Act provides for the establishment of the Agriculture, Fisheries and Food Authority, the administration of matters of agriculture and the preservation, utilization and development of agricultural land and related matters. "Agriculture" in this Act means cultivation of land and the use of land and water for any purpose of husbandry, aquaculture and food production and includes cultivation of crops and horticultural practice, breeding of aquatic animals and plants, the use of land, fish harvesting and (e) the use of land for agroforestry.The Act requires the Authority in consultation with the county governments to among others promote best practices. Each county government is required to keep a register of land development orders and land preservation orders, which they may issue under this Act.

Meanwhile the Vipingo Mixed Use Masterplan should ensure sustainable development principles are adopted throughout the entire development cycle, with the residents and local community enjoying the benefit of natural resources they have been bestowed with.

4.5.10 Fisheries Management and Development Act, No. 35 of 2016

The act provides for the development, management, exploitation, utilization and conservation of fisheries resources in Kenya. Its most relevant provisions that relate to pollution control from land-based sources include part X of the Act which provides for measures on prevention, protection, and conservation of fishery waters. Kenya's fishery waters include also waters of the maritime zones.

Vipingo Mixed use Development Master Plan has preserved the beach front and is expected to ensure all land use plans protect entire fishery and prevents waters pollution or discharge of waste into any of Kenya's fishery waters such the beach fronts.

4.5.11 Land Act, No. 6 of 2012

This is an ACT of Parliament to give effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land based resources, and for connected purposes. The Land Act of 2012 subsection (1) states that 'any land may be converted from one category to another in accordance with the provisions of this Act or any other written law.' It continues to state in subsection (2) that Without prejudice to the generality of subsection (1)

a) Public land may be converted to private land by alienation
b) Subject to public needs or in the interest of defence, public safety, public order, public morality, public health, or land use planning, public land may be converted to community land
c) private land may be converted to public land by
    i. Compulsory acquisition;
    ii. Reversion of leasehold interest to Government after the expiry of a lease; and
    iii. Transfers; or
    iv. Surrender.
d) Community land may be converted to either private or public land in accordance with the law relating to community land enacted pursuant to Article 63(5) of the Constitution.

Part viii of this ACT provides procedures for compulsory acquisition of interests in land. Section 111 (1) States that if land is acquired compulsorily under this Act, just compensation shall be paid promptly in full to all persons whose interests in the land have been determined. The Act also provides for settlement programmes. Any dispute arising out of any matter provided for under this Act may be referred to the Land and Environment Court for determination.

Vipingo Mixed use Development Master Plan recognizes Public and Private land rights through physical planning and land use zonation. It also recognizes and protects private land rights and provides for derivative rights from all categories of land rights holding.

4.5.12 The Land Registration Act, No. 3 of 2012

The Land Registration Act is in place to revise, consolidate and rationalize the registration of titles to land, to give effect to the principles and objects of devolved government in land registration, and for connected purposes. This Act applies to Subject to section 4, this Act shall apply to:

- Registration of interests in all public land as declared by Article 62 of the Constitution;
- Registration of interests in all private land as declared by Article 64 of the Constitution; and
- Registration and recording of community interests in land.

Vipingo Mixed use Development Master Plan will need to ensure that any land uses that entail registration of a person as the proprietor of land shall vest in that person the absolute ownership of

that land together with all rights and privileges belonging or appurtenant thereto; and (b) the registration of a person as the proprietor of a lease shall vest in that person the leasehold interest described in the lease, together with all implied and expressed rights and privileges belonging or appurtenant thereto and subject to all implied or expressed agreements, liabilities or incidents of the lease.

4.5.13 The Environment and Land Court Act, No. 19 of 2011

This Act is in place to give effect to Article 162(2) (*b*) of the Constitution; to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes.

This Act shall be of great essence to Vipingo Development Ltd, public, interested or affected party that may want to litigate against the Vipingo Mixed use Development Master Plan development on settlement issues, location of development or even effects of the envisioned projects to the public.

4.5.14 The National Land Commission Act, No. 5 of 2012

Section 5 of the Act outlines the Functions of the Commission, pursuant to Article 67(2) of the Constitution as follows 5(1): -

- to manage public land on behalf of the national and county governments;
- to recommend a national land policy to the national government;
- to advise the national government on a comprehensive programme for the registration of title in land throughout Kenya;
- to conduct research related to land and the use of natural resources, and make recommendations to appropriate authorities;
- to initiate investigations, on its own initiative or on a complaint, into present or historical land injustices, and recommend appropriate redress;
- to encourage the application of traditional dispute resolution mechanisms in land conflicts;
- to assess tax on land and premiums on immovable property in any area designated by law; and
- To monitor and have oversight responsibilities over land use planning throughout the country.

Vipingo Mixed use Development Master Plan recognizes Public and Private land rights through physical planning and land use zonation. It also recognizes and protects private land rights and provides for derivative rights from all categories of land rights holding. National Land commission may manage designated public land on behalf of the national and county government of Kilifi.

4.5.15 Physical and Land use Planning Act, 2019

This Physical and Land Use Planning Act, 2019 make provision for the planning, use, regulation and development of land and for connected purposes. Article 5 of the Act under Principles and norms of physical and land use planning notes that every person engaged in physical and land use planning development activities shall be in a manner that integrates economic, social and environmental needs of present and future generations.

Article 4 notes major developments should be subjected to environmental and social impact assessment. The developers and implementers of the Vipingo Mixed Use Development Master Plan should ensure compliance with the provisions of the act and land use planning. Such entails conducting EIA for various envisioned projects.

4.5.16 County Governments Act, No. 17 of 2012

This Act vests responsibility upon the County Governments in planning of development projects within their areas of jurisdiction be it projects of importance to the local County government or those of national importance.

Section 102 of the Act provides the principles of planning and development facilitation which include integration of national values in county planning, protect the right to self-fulfilment within the county communities and with responsibility to future generations, protection of rights of minorities and marginalized groups and communities, promotion of equity resource allocation, among others.

Section 103 of the Act outlines the prime objective of county planning which aligned to the bill of rights and the constitution of Kenya.

Vipingo Mixed use Development Master Plan has taken into consideration County Government of Kilifi legislations. The master plan has further considered national guidelines and the aspect of public participation in every aspect of the planning process the strategic environmental assessments process. Environmental impact assessment reports are expected to be undertaken for individual developments. County Government of Kilifi is tasked with the role to develop laws and regulations giving effect to the requirement for effective citizen participation in development planning and performance management within the county and envisioned development.

4.5.17 Urban Areas and Cities Act, No. 13 of 2011

The Act came into function with regard to Article 184 of the Constitution providing regulations on the classification, governance and management of urban areas and cities and further providing the criteria of establishing urban areas.

Part III of the Act gives the regulations and functions of every city or municipality with regard to integrated development plans, which shall include but not limited to environmental plans and disaster preparedness, within the area of jurisdiction in achieving objects of devolved governments under section 174 of the constitution while maintaining the socio-economic rights of the people.

Moreover, in the first schedule, the Act enlists the services that the any municipality, City or Town shall provide to its residents, which include but not limited to traffic control and parking, water and sanitation, refuse collection, solid waste management, pollution abatement services among others. Vipingo Mixed use Development Master Plan has taken into consideration regional urban areas planning. Key linked plans include Kilifi integrated Development Plan and Kilifi County Spatial plan.

4.5.18 Occupational Safety and Health Act, No. 15 of 2007

Before any premises are occupied, or used a certificate of registration must be obtained from the chief inspector. The occupier must keep a general register. The Act covers provisions for health, safety and welfare. This Act applies to all workplaces where any person is at work, whether temporarily or permanently.

Vipingo Mixed use Development Master Plan implementers will need to ensure safety, health and welfare of persons at work, and protect persons other than persons at work against risks to safety and health arising out of, or in connection with, the activities of persons at work. Some of the areas addressed are machinery safety, chemical safety and health, safety and welfare. Special provisions are also provided in the ILO conventions on Occupational Safety and Health Convention, 1981 (No. C.155) and Recommendation R.164.

4.5.19 Work Injury Benefits Act, 2007 (Revised Edition, 2012)

This Act of Parliament provides for compensation to employees for work related injuries and diseases contracted in the course of their employment and for connected purposes.

Part III Section 10 states that an employer is liable to pay compensation in accordance with the provisions of this Act to an employee injured while at work. An employee is not entitled to compensation if an accident, not resulting in serious disablement or death, is caused by the deliberate and wilful misconduct of the employee.

Part IV Section 22 states that subject to the provisions of this section, an employer shall report an accident to the Director in the prescribed manner within seven days after having received notice of an accident or having learned that an employee has been injured in an accident.

Part VI Section 38 states that an employee who contracts a disease specified in the second schedule that arose out of and in the course of the employee's employment, is deemed to have contracted an occupational disease and is entitled to compensation as if the disablement caused by the disease had been caused by an accident. In section 41, an employer shall, within fourteen days after receiving notice or learning of the employee occupational disease, report such disease, in the prescribed manner to the Director, irrespective of whether the employer may be of the opinion that the employee did not contract such disease in employment or contracted it in the employment of a previous employer.

Vipingo Mixed use Development Master Plan implementers will need to ensure all developments and businesses comply with Work Injury Benefits Act, 2007 to ensure compensation to employees for work related injuries and diseases contracted in the course of their employment and for connected purposes.

4.5.20 Public Health Act (Cap. 242)

Part IX, section 115, of the Act states that no person/institution shall cause nuisance or condition liable to be injurious or dangerous to human health. Section 116 requires that Local Authorities take all lawful, necessary and reasonably practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable to be injurious or dangerous to human health.

Vipingo Mixed use Development Master Plan implementers are expected to ensure nuisance or conditions such as waste pipes, sewers, drainers or refuse pits in such state, situated or constructed should not be offensive or injurious to public health.

4.5.21 Food, Drugs and Chemical Substances (Cap 254)

This Act provides for the prevention of adulteration of food, drugs and chemical substances and for matters incidental thereto and connected therewith. The Act prohibits against sale of unwholesome, poisonous or adulterated food; labelling, packaging, treating, processing, selling or advertising any drug in contravention of any regulations made under this Act, or in a manner that is false, misleading or deceptive as regards its character, constitution, value, potency, quality, composition, merit or safety; selling any device that, when used according to directions on the label or contained in a separate document delivered with the device or under such conditions as are customary or usual, may cause injury to the health of the purchaser or user thereof. A person who contravenes this Act shall be guilty of an offence.

Vipingo Mixed use Development Master Plan has envisioned tourism facilities including hotels and restaurants. It is anticipated that such developments should comply with the Food, Drugs and Chemical Substances. Any developer intending to deal with foods and drugs is also expected to comply with the legislation.

4.5.22 Employment Act, 2007 (Revised Edition, 2014)

The Act is enacted to consolidate the law relating to trade unions and trade disputes, to provide for the registration, regulation, management and democratization of trade unions and employers organizations and federations. Its purpose is to promote sound labour relations through freedom of association, the encouragement of effective collective bargaining and promotion of orderly and expeditious dispute the protection and promotion of settlement conducive to social justice and economic development for connected purposes.

Vipingo Mixed use Development Master Plan is envisioned to result into employment and jobs upon implementation of the envisioned land use plans. The employment Act will therefore provide for employer – employee relationship that is important for the activities and developments that would promote management of the mixed-use development.

4.5.23 Penal Code Act (Cap 63)

Section 191 of the penal code states that if any person or institution that voluntarily corrupts or foils water from public springs or reservoirs, rendering it less fit for its ordinary use is guilty of an offence. Section 192 of the same Act says a person who makes or vitiates the atmosphere in any place to make it noxious to health of persons /institution, dwelling or business premises in the neighbourhood or those passing along public way, commit an offence.

Vipingo Mixed use Development Master Plan has set up clear land use plans with the SEA proposing for waste water treatment plans, and integrated solid waste management plan that conforms to Penal code on pollution prevention.

4.5.24 Kenya Information and Communications Act, 1998 (Revised Edition, 2015)

This is an Act of Parliament that provides for the establishment of the Communications Commission of Kenya to facilitate the development of the information and communications sector (including broadcasting, multimedia, telecommunications and postal services) and electronic commerce, to provide for the transfer of the functions, powers, assets and liabilities of the Kenya Posts and Telecommunication Corporation to the Commission, the Telcom Kenya Limited and the Postal Corporation of Kenya, and for connected purposes.

Vipingo Mixed use Development Master Plan has ensured the integration of information technology as an avenue to enhance telecommunication system and services to the developers and envisioned development.

4.5.24.1 The Kenya Information and Communications (Licensing and Quality of Service) Regulations, 2010

Section 13 Sub-section 1 (b) states that a licensee shall, in addition to the terms and conditions of the licence maintain service quality, while considering environmental and operating conditions.

Section 21 Sub-section 3 (b and c) a licensee shall, when installing its facilities, take all reasonable steps to ensure that it causes as little detriment or damage, and inconvenience to the public, as is practicable in the circumstances. Vipingo Mixed use Development Master Plan implementors are expected to ensure that respective developers take all reasonable steps to protect the safety of persons and property and protect the environment.

4.5.25 Industrial Property Act, No. 3 of 2001

The Act provides for the promotion of inventive and innovative activities, to facilitate the acquisition of technology through the grant and regulation of patents, utility models, technology innovations and industrial designs, to provide for the establishment, powers and functions of the Kenya Industrial Property Institute and for purposes incidental thereto and connected therewith.

Part XI Section 80 states that Subject to this section, where—

> (a) the public interest, in particular, national security, nutrition, health, environmental conservation, or the development of other vital sector of the national economy so requires; or
>
> (b) the Managing Director determines that the manner of exploitation of an invention by the owner of the patent or his licensee is not competitive,

the Minister may, upon application to him in the prescribed form and after consultation with the Institute and the owner of the patent, order that the protected invention shall be exploited by a

Government Ministry, Department, agency or other person as the Minister may designate in the order subject to the payment of adequate compensation to the owner of the patent in accordance with this section.

The industrial zone users envisioned by Vipingo Mixed use Development Master Plan are anticipated to have the exclusive rights to sell or cause to be sold for commercial or industrial purposes the goods in which the design is incorporated.

4.5.26 Consumer Protection Act, 2012 (Revised Edition, 2016)

This is an Act of Parliament to provide for the protection of the consumer prevent unfair trade practices in consumer transactions and to provide for matters connected with and incidental thereto.

The industrial zone users envisioned by Vipingo Mixed use Development Master Plan are anticipated to prohibit against unfair practices where a person makes a false, misleading or deceptive representation.

4.5.27 Basic Education Act, 2013 (Revised Edition, 2017)

This Act gives effect to Article 53 of the Constitution and other enabling provisions; to promote and regulate free and compulsory basic education; to provide for accreditation, registration, governance and management of institutions of basic education; to provide for the establishment of the National Education Board, the Education Standards and Quality Assurance Commission, and the County Education Board and for connected purposes.

The institutional zone users envisioned by Vipingo Mixed use Development Master Plan provides for private educational institutions. Such institutions will be subject to the Constitution and the provisions of this Act, any person may establish and maintain a private school and such institutions must be registered.

4.5.28 The Traffic Act (Cap 403)

The Traffic Act gives provisions and guidelines that govern the Kenya roads transport sector.

These guidelines are essential to private, public and commercial service vehicles in ensuring safety and sanity on the roads envisioned by Vipingo Mixed use Development Master Plan hence ensuring the environment; the human being a component, is safeguarded.

4.5.29 The National Gender and Equality Act, 2011

National Gender Equality Commission is a constitutional Commission established by an Act of Parliament in August 2011, as a successor commission to the Kenya National Human Rights and Equality Commission pursuant to Article 59 of the Constitution.

NGEC derives its mandate from Articles 27, 43, and Chapter Fifteen of the Constitution; and section 8 of NGEC Act (Cap. 15) of 2011, with the objectives of promoting gender equality and freedom from discrimination.

Gender mainstreaming in projects ensures that the concerns of women and men form an integral dimension of the Vipingo mixed use development design, implementation, execution and the monitoring and evaluation ensures that women and men benefit equally, and that inequality is not perpetuated.

4.5.30 National Museums and Heritage Act, No. 6 of 2006;

The Act consolidates all the laws relating to national museums and heritage; and provides for the establishment control, management and development of national museums and the identification, protection, conservation and transmission of the cultural and natural heritage of Kenya. The act repeals the Antiquities and Monuments Act and the National Museums Act.

The execution of Vipingo Mixed use Masterplan should ensure as per the National Museums Act; 'Chance finds procedure' are employed for any archaeological resources including antiquities encountered during specific project implementation to be protected and conserved to promote cultural resources.

4.5.31 HIV and AIDS Prevention and Control Act, 2006 (Revised Edition, 2014)

This Act provides measures for the prevention, management and control of HIV and AIDS, to provide for the protection and promotion of public health and for the appropriate treatment, counselling, support and care of persons infected or at risk of HIV and AIDS infection, and for connected purposes. Part II Section 7 states that the Government shall ensure the provision of basic information and instruction on HIV and AIDS prevention and control to employees of all Government Ministries, Departments, authorities, and other agencies; and employees of private and informal sectors. The information provided under this section shall cover issues such as confidentiality in the workplace and attitudes towards infected employees and workers. Part VIII Section 31 requires that no person shall be denied access to any employment for which he is qualified; or transferred, denied promotion or have his employment terminated on the grounds only of his actual, perceived or suspected HIV status

Vipingo Mixed use Development Master Plan execution is expected to provide for the protection and promotion of public health and for the appropriate treatment, counselling, support and care of persons infected or at risk of HIV and AIDS infection, and for connected purposes.

4.5.32 The Sexual Offences Act, 2006 and its amendment 2012

The act of Parliament makes provision about sexual offences, their definition, prevention and the protection of all persons from harm from unlawful sexual acts, and for connected purposes.
The act emphasis on observing a standard work ethic to ensure persons from both genders are not subjected to sexual offences.
The Act highlights key aspects within its provisions as follows;

- Rape.
- Attempted rape.
- Sexual assault.
- Compelled or induced indecent acts.
- Acts which cause penetration or indecent acts committed within the view of a child or person with mental disabilities.
- Defilement.
- Attempted defilement.
- Gang rape.
- Indecent act with child or adult.
- Promotion of sexual offences with a child.
- Child trafficking.
- Child sex tourism.
- Child prostitution.
- Child pornography.
- Exploitation of prostitution.
- Trafficking for sexual exploitation.
- Prostitution of persons with mental disabilities.
- Incest by male persons.
- Incest by female persons.
- Sexual harassment.
- Sexual offences relating to position of authority and persons in position of trust.
- Sexual relationship which pre-date position of authority or trust.
- Deliberate transmission of HIV or any other life threatening sexually transmitted disease.
- Administering a substance with intent.
- Distribution of substance by juristic persons.
- Cultural and religious sexual offences.
- Non-disclosure of conviction of sexual offences.
- Vulnerable witnesses.
- Vulnerable witnesses to be notified of protective measures.

- Evidence of surrounding circumstances and impact of sexual offence.

Ample working environment should prevail in the execution of the Vipingo mixed use master plan and specifically in all projects and workplaces.

4.5.33 Persons with Disabilities Act, 2003 (Revised Edition, 2016)

It is an Act of Parliament to provide for the rights and rehabilitation of persons with disabilities; to achieve equalisation of opportunities for persons with disabilities; to establish the National Council for Persons with Disabilities; and for connected purposes.
Part III Section 12 states that:

(1) No person shall deny a PLWD access to opportunities for suitable employment.
(2) A qualified employee with a disability shall be subject to the same terms and conditions of employment and the same compensation, privileges, benefits, fringe benefits, incentives or allowances as qualified able-bodied employees.
(3) An employee with a disability shall be entitled to exemption from tax on all income accruing from his employment.

The developers of Vipingo Mixed use Development Master Plan are expected to ensure provision of the rights of persons with disabilities; to achieve equalisation of opportunities for persons with disabilities. Such opportunities should cut in all land use plans developments, industrial, residential, commercial, tourism amongst others.

4.6 Multilateral Environmental Agreements / Treaties

There are number Multilateral Environmental Agreements (MEAs) that are relevant to the proposed Master Plan and are reviewed in detail. These are highlighted in this section.

4.6.1 Vienna Convention on the Protection of the Ozone Layer

Intergovernmental negotiations for an international agreement to phase out ozone depleting substances concluded in March 1985 with the adoption of the Vienna Convention for the Protection of the Ozone Layer. This Convention encourages intergovernmental cooperation on research, systematic observation of the ozone layer, monitoring of CFC production, and the exchange of information.

The convention's declaration demands a voluntary attempt at monitoring development processes, their resultant emissions and the impacts on the ozone layer for purposes of knowledge and information sharing in order to combat the same.

The Master Plan proposes industrial development, and therefore the SEA report has determined and put in place measures to minimize the emissions that affect the ozone layer through technological monitoring of gaseous emissions and their toxicity levels for purposes of minimizing the same.

4.6.2 United Nations Convention on Biological Diversity (UNCBD)

The convention promotes the protection of ecosystems and natural habitats, respects the traditional lifestyles of indigenous communities, and promotes the sustainable use of resources.

The execution of developments envisioned by Vipingo Mixed use Development Master Plan will impact to the flora and fauna; as such, both the developers and the contractor must ensure that their activities do not affect the immediate ecosystems negatively and that the livelihoods of the local people are not negatively affected but rather enhanced.

4.6.3 African Convention on the Conservation of Nature and Natural Resources

The main objective is to facilitate sustainable use of the above resources. The convention was adopted in Algiers on 15th September, 1968 and came into force on 16th June 1969.

Vipingo Mixed use Development Master Plan has provided for land use plans that reaffirms the importance of natural resources both renewable and non-renewable, particularly the soil, water, flora and fauna which is in line with the African Convention on the Conservation of Nature and Natural Resources.

4.6.4 The World Commission on Environment and Development (The Brundtland Commission of 1987)

The Commission in its 1987 report dubbed "Our Common Future" focused on the environmental aspects of development, in particular the emphasis on sustainable development that produces no lasting damage to the biosphere and to particular ecosystems. In addition to environmental sustainability is economic and social sustainability. Economic sustainable development is development for which progress towards environmental and social sustainability occurs within available financial resources.

Vipingo Mixed use Development Master Plan with the ethos of social and sustainable development that maintains the cohesion of a society and its ability to help its members work together to achieve common goals, while at the same time meeting individual needs for health and well-being, adequate nutrition, and shelter, cultural expression and political involvement.

4.6.5 The Ramsar Convention for the conservation and sustainable utilization of wetlands

The Ramsar Convention on Wetlands is primarily concerned with the conservation and management of Wetlands. Parties to the convention are required to promote prudent use of wetlands within their territories and to take measures for the conservation of the same. One way to conserve the wetlands (as proposed under this convention) is establishing nature reserves whether they are included in the Ramsar list or not.
The wetlands include swamps, marshes, bogs, soaks, shallow lakes, ox-bow lakes, river meanders and flood plains, as well as riverbanks, lakeshores where wetland plants grow. They also include marine and inter-tidal wetlands such as deltas, estuaries, mudflats, mangroves, salt marshes, sea grass beds, shallow coral reefs and creeks.

The Vipingo Mixed Use Master Plan is expected to observe and adhere strictly to the Ramsar Convention's principles of prudent use of wetlands especially in controlling developments along the marine areas particularly because the hospitality zone lies in close proximity to the Indian Ocean. The Master Plan and SEA proposes measures to conserve this wetland area.

4.6.6 The 1992 United Nations Framework Convention on Climate Change (UNFCCC)

The United Nations Framework Convention on Climate Change provides the basis for concerted international action to mitigate climate change and to adapt to its impacts. Its provisions are far-sighted, innovative and firmly embedded in the concept of sustainable development. With 189 Parties, the Convention has nearly a universal membership.

According to Article 2, the Convention's ultimate objective is "to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic [originating in human activity] interference with the climate system". This objective is qualified in that it "should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner". In stating this objective, the Convention reflects concerns that the

earth's climate system is threatened by a rise in atmospheric greenhouse gas (GHG) concentrations, which is caused by increased anthropogenic GHG emissions. The Convention does not state a limit for total anthropogenic GHG emissions which would have to be respected to reach the objective. Nor does it indicate the level of total GHG concentrations beyond which "dangerous anthropogenic interference with the climate system" would occur.

The Vipingo Mixed Use Master Plan envisions a development that adapt to climate change. Another important factor is that the plans aim to mitigate climate change and to adapt to its impacts. The Master plan provisions and land uses are far-sighted, innovative and firmly embedded in the concept of sustainable development.

4.6.7 Earth Summit on Sustainable Development Agenda 21

The Agenda 21 entails a comprehensive plan of action to be undertaken globally, nationally and locally by organizations affiliated to the United Nations, governments, and other groups in every area in which human's impact on the environment. Kenya continues to implement Agenda 21 plan of action by incorporating its principles in national policies, plans, programmes and strategies.

The provisions have also been incorporated in the Master Plan to promote sustainable development, which comprises of the three (3) underlying tenets of economic, social and ecology, which are well articulated in the SEA.

4.6.8 United Nations Convention on the Law of the Sea (UNCLOS)

Part XII (Articles 192 to 237) of the UNCLOS is devoted to "Protection and Preservation of the Marine Environment" and the states are obligated to 'protect and preserve the marine environment and take measures that are necessary to prevent, reduce and control pollution of the marine environment'. Article 207 of UNCLOS deals with "Pollution from Land-based Sources", and provides that 'states shall adopt laws and regulations to prevent, reduce and control pollution of the marine environment from land-based sources, including rivers, estuaries, pipelines and outfall structures, taking into account internationally agreed rules, standards and recommended practices and procedures', among others.

The Vipingo Mixed Use Master Plan envisions a development that Protects and Preserves the Marine Environment". The SEA has suggested measures that are necessary to prevent, reduce and control pollution of the marine environment.

4.6.9 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972)

The provisions of Article 3 and Article 4 of the Protocol requires relevant government agencies, private sector, and the coastal inhabitants to apply a precautionary approach so that the dumping of all waste other than that for which a permit has been issued by appropriate authorities such as NEMA and Municipal authorities.

The Vipingo Mixed Use Master Plan envisions a sustainable environment, towards this, the SEA has suggested incorporation of integrated solid waste management and recommended for approval of such a facility as per Kenyan Waste regulations.

4.6.10 The UNEP's Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA)

The GPA draws its legal context primarily from Article 207 of UNCLOS and it is essentially an institutional-strengthening, technical-assistance and capacity-building programme. The GPA works through the existing UNEP's Regional Seas Conventions to develop regional and national level action plans to protect the marine environment from land-based activities. The GPA has identified at least nine pollutant or source nodes including municipal wastewater, heavy metals, litter, nutrients, oil, physical alterations and destruction of habitats (PADH), sediment

mobilization and persistent organic pollutants (POPs). The provisions of Section 55(7) of EMCA 1999 relate directly to Kenya's obligations under UNEP's GPA for the protection of the coastal environment from land-based sources. It mandates the minister to issue regulations to control pollution in rivers and estuaries from pipeline and outfall structures in vessels, aircraft and other engines used in the coastal zones.

Vipingo Mixed use Development Master Plan through the SEA has shown commitment to the protection of the coastal environment from land-based sources. Key amenities such as waste water treatment plant and integrated solid waste management plan have been recommended.

4.6.11 Convention on the Elimination of all forms of Discrimination against Women

The Convention places explicit obligations on states to protect women and girls from sexual exploitation and abuse.

The realization of a non-discriminatory environment can be realized through preventive and mitigative measures by the SEA on matters of social concerns.

4.6.12 International Labour Organization (ILO) Conventions

The International Labour Organization (ILO) is built on the constitutional principle that universal and lasting peace can be established only if it is based upon social justice. The ILO has generated such hallmarks of industrial society as the eight-hour working day, maternity protection, child-labour laws, and a range of policies that promote workplace safety and peaceful industrial relations.

The ILO has four principal strategic objectives:

- To promote and realize standards, and fundamental principles and rights at work.
- To create greater opportunities for women and men to secure decent employment.
- To enhance the coverage and effectiveness of social protection for all.
- To strengthen tri-parties and social dialogue.

The key ILO Conventions applicable to the proposed Vipingo Mixed Use Master Plan include:

- *Equal Remuneration Convention (1951) (No. 100) - Calls for equal pay and benefits for men and women for work of equal value.*
- *Discrimination (Employment and Occupation) Convention (1958) (No. 111) - Calls for a national policy to eliminate discrimination in access to employment, training, and working conditions, on grounds of race, colour, sex, religion, political opinion, national extraction or social origin, and to promote equality of opportunity and treatment.*
- *Minimum Age Convention (1973) (No. 138) - Aims at the abolition of child labour, stipulating that the minimum age for admission to employment shall not be less than the age of completion of compulsory schooling which in Kenya has been capped at 18 years.*
- *Worst Forms of Child Labour Convention (1999) (No. 182) - Calls for immediate and effective measures to secure the prohibition and elimination of the worst forms of child labour which include slavery and similar practices, forced recruitment for use in armed conflict, use in prostitution and pornography, any illicit activity, as well as work which is likely to harm the health, safety, and morals of children.*

The ILO has generated such hallmarks of industrial society as the eight-hour working day, maternity protection, child-labour laws, and a range of policies that promote workplace safety and peaceful industrial relations.

4.6.13 Sustainable Development Goals (SDGs)

In October 2015, The United Nations adopted 17 Sustainable Development Goals aimed at transforming the world. Eleven of these goals have some bearing on the Vipingo Mixed Use Master Plan. They include Goal number 1 aiming at reducing poverty, Goal 2, reducing hunger; Goal 3,

good health and wellbeing; Goal 4, clean water and sanitation; Goal 7, affordable clean energy; Goal 8, decent work and economic growth; Goal 9, Industrial growth, innovation and infrastructure; Goal 11, sustainable cities and communities; Goal 12, responsible consumption and production; Goal 13, climate action; and Goal 15, life on land. As described in chapter three and eleven of this report, the master plan has addressed each of these Goals in its plan components and infrastructure.

The projects and programs outlined in the proposed Vipingo Masterplan are aligned with the objectives of all the 17 SDGs and their 169 targets in the three dimensions of sustainable development i.e. economic, social and environmental. In this regard, Vipingo Development Limited has identified SDGs as relevant to its various sectors.

4.7 National and County Government Approvals and Permits

The implementation of all key developments and specific projects envisioned under the Vipingo Mixed Use Development Master Plan require approvals, permits and licenses from relevant governing Authorities which has been analyzed in Table 4.1. It is anticipated that the Master Plan owner Vipingo Development Limited, will liaise with both the National Government Institutions and The County Government of Kilifi to ensure compliance to all requisite licenses and permits expected for various projects and developments.

Table 4-1 National and County Government Approvals and Permits

Laws and Regulations linking with the Master Plan	Issuing / approving Authority	Permit / license Requirements
Environmental Management and Coordination Act (EMCA, Cap 387) and relevant amendments	National Environment and Management Authority (NEMA)	▪ Obtain EIA License prior to commencement of individual projects
a) The Environmental Impact (Assessment and Auditing) Regulations, 2003 and (Amendment) Regulations, 2016 (L.N 149) & 2019 (L.N 32)	National Environment and Management Authority (NEMA)	▪ Undertake Annual Environmental Audit (EA) of the project during operation
b) Environmental Management and Coordination (Water Quality) Regulations, 2006	National Environment and Management Authority (NEMA)	▪ Quarterly effluent discharge quality and quantity monitoring through sampling. ▪ Apply for an effluent discharge license (EDL) (for the effluent treatment plant)
c) Environmental Management and Coordination (Waste Management) Regulations, 2006	National Environment and Management Authority (NEMA)	▪ Obtain waste transportation and disposal Permit or Contract a licenced waste transport and disposal company
d) Environmental Management and Coordination of Controlled Substances Regulations, 2007	National Environment and Management Authority (NEMA)	▪ Undertake a Free Prior Informed consultation

(Legal Notice No.73 of 2007)		
e) EMCA (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations 2006	National Environment and Management Authority (NEMA)	▪ Obtain EIA License prior to commencement of the project since it may have an adverse impact on the ecosystem.
f) Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations, 2009	County Government of Kilifi	▪ Obtain Noise and Excessive Vibration permit
g) Environmental Management and Coordination (Air Quality) Regulations, 2014	National Environment and Management Authority (NEMA)	▪ Conduct ambient air quality analysis of the generators as recommended under the third schedule of the regulations.
Building Code, 2000;	County Government of Kilifi	▪ Obtain County approval of Building plans (such as campsites and substation offices) ▪ Obtain certificate of completion for buildings (such as campsites and substation offices)
Civil Aviation Act No. 21 of 2013;	Kenya Civil Aviation Authority	▪ Obtain a permit for erection of any telecommunication Towers
Energy Act, 2019;	Energy Petroleum and Regulatory commission	▪ Obtain Permit and License to carry out electrical installation work (for contractor) ▪ Ensure electrical workers have a certificate for electrical works.
Occupational Safety and Health Act, No. 15 of 2007;	Directorate of Occupational Health and Safety (DOSHs)	▪ Obtain Registration of Workplace Certificate for workplaces (Campsites, substation offices etc) ▪ Undertake Annual Safety and health Audit ▪ Establish a Safety and Health Committee ▪ Undertake appropriate risk assessment of the Workplace

Physical and Land use Planning Act, 2019;	Ministry of lands, Physical planning Office	▪ Subject the specific developments projects to environmental and social impact assessment – issuance of an EIA license ▪ Processing of easements and way-leaves;
Employment Act, No 11, 2007;	Kenya Revenue Authority, NSSF, NHIF	▪ Ensure Statutory deductions without delay to appropriate government agencies e.g. Kenya Revenue Authority, NSSF, NHIF
Water Act, 2016;	Water Resources Authority (WRA)	▪ Apply for Water Extraction Permit ▪ Obtain EIA license prior to digging boreholes
Work Injury Benefits Act, 2007;	Directorate of Occupational Health and Safety (DOSHs)	▪ Provision of compulsory insurance for all employees
The Traffic Act Cap 403	National Transport and Safety Authority	▪ Motor vehicles and trailers for developers as envisioned by the Master Plan to be licensed. ▪ Drivers must hold Valid driving licence

5 PUBLIC PARTICIPATION & CONSULTATION / STAKEHOLDER ENGAGEMENT

5.1 Introduction

Public Participation and Consultation Process is a policy requirement by the Government of Kenya to achieve the fundamental principles of sustainable development. It is enshrined in Article 10(2) and 69(d) of the Constitution of Kenya 2010, and is a mandatory procedure as stipulated by Legal Notice 101 of the Environmental Management and Coordination Act (EMCA), 1999 (Cap 387); Section 3 of the EIA/EA regulations, 2003; Section 87 & 113 of the County Governments Act, 2012 and the National Guidelines for Strategic Environmental Assessment (SEA) 2012. It is an important process through which stakeholders including beneficiaries and members of public living in the area envisioned for development (both public and private), are given an opportunity to contribute to the overall Master Plan design before implementation. In addition, the process creates a sense of responsibility, commitment, and local ownership for smooth implementation.

This chapter describes the process of the public participation and consultation that was adopted to identify the key issues of the proposed Vipingo Mixed Use Development Master Plan. Views and concerns from the residents, local leaders, surrounding institutions and development partners in Vipingo area and Kilifi County in general, who in one way or another would be affected or have interest in the proposed Vipingo Mixed Use Development Master Plan.

5.2 Objectives of the Consultation and Public Participation

The objective of the consultation and public participation was to:

1. Disseminate and inform the stakeholders about the development with special reference to its key components and location.
2. Create awareness among the public on the need for the SEA study process for the proposed Vipingo Mixed Use Development Master Plan.
3. Gather comments, suggestions, and concerns of the interested and affected parties.
4. Incorporate all the information collected in the SEA study report for decision making process.

In addition, the process enabled:

1. The establishment of a communication channel between the public and the team of consultants, the developer, and the key government agencies.
2. The concerns of the stakeholders to be known to the concerned parties at an early phase of master plan development for decision-making purposes.

5.3 Stakeholder Identification and Engagement Plan

Key stakeholders consulted during the SEA study were identified in accordance with the areas/sectors that are affected directly or indirectly by the proposed Master Plan. The criteria used to identify various stakeholders was based on the legal mandates of various institutions, assessment of the different interests of the stakeholders, stakeholder power rights and responsibilities and their role in the proposed Vipingo Mixed Use Development Master Plan as outlined in the stakeholder engagement plan (Table 5-1).

Table 5-1: Stakeholder Engagement Plan

Stakeholder Category/ organization, group or individual	Potential role in the SEA activity	Engagement strategy	Follow-up strategy plans for feedback or continued involvement
▪ ***Public Sector and Key Ministries/ Inter-ministerial Lead Agencies and Key Public Institutions***	▪ Give their views on the effect of the proposed Vipingo Mixed-Use Development ▪ Interlinkage of the Plan with other existing Plans ▪ Identify any Improvement needed for the plan	▪ Invitation to public meetings ▪ Special consultations at the organizational levels ▪ Case studies to specific projects/ programs ▪ Review of any relevant existing documents	▪ Invitation to SEA validation meeting ▪ Implement the final recommendations ▪ Participate in Monitoring and evaluation of the implementation of SEA recommendations
▪ ***Private Sector Actors/ Investors and Associations***	▪ Come up with ideas to improve the plan ▪ Give the challenges and the current trends most preferred by investors in such a Mixed-Use setting	▪ Invited to participate in consultation meetings ▪ Special consultations at the organisational levels	▪ Invitation to SEA validation meeting ▪ Implement the final recommendations ▪ Participate in Monitoring and evaluation of the implementation of SEA recommendations
▪ ***Political Leadership***	▪ Political leaders have a great influence on the various policies, plans and programs ▪ Play a major role in creating awareness on the Master plan ▪ Influence creation of more favourable policies, programs and plans to hasten economic growth in the country ▪ Help prevent negative perception of the Master Plan	▪ Invitation of some political leaders to participate in public consultation meetings	▪ Invitation to SEA validation meeting

Stakeholder Category/ organization, group or individual	**Potential role in the SEA activity**	**Engagement strategy**	**Follow-up strategy plans for feedback or continued involvement**
▪ ***Civil Society Organisations (BMUs, NGO's and CBOs)***	▪ Help to ensure that gender and other vulnerable groups issues and concerns are incorporated in the entire SEA process. ▪ Enhance awareness of the Master Plan since they deal with people on the ground	▪ Invitation to participate in public consultation meetings	▪ Invitation to SEA validation meeting ▪ Implement the final recommendations especially on community-related issues
▪ ***Professional Associations/ Experts/ Research and Academic Institutions***	▪ Lead in research and consultancy ▪ They are potential investors in the Vipingo Mixed-Use Development	▪ Invitation to public meetings ▪ One on one consultations	▪ Invitation to SEA validation meeting ▪ Participate in Monitoring and evaluation of the implementation of SEA recommendations

5.4 Approach on Stakeholders Consultation

Key Government Ministries and Lead Agencies, Kilifi County Government officials, private investors, interested and affected individuals and institutions within and neighbouring the proposed Vipingo Development were consulted in the Strategic Environmental Assessment (SEA) study. In total, approximately 73 stakeholders were identified/mapped and consulted during the SEA exercise.

The exercise was conducted by experienced experts via interviews and discussions under the guidance of interview schedules developed to capture the general and specific concerns, comments and issues comprehensively. The completion of such schedules subsequently allowed for the synthesis and analysis of issues that arose which provided basis upon which the environmental, economic and social aspects of the SEA were undertaken. The purpose for such interviews was to identify the positive and negative impacts that were studied into detail during the SEA draft stage and subsequently promoted proposals on the best practices to be adopted and mitigate the negative impacts respectively.

5.5 Methodology used for Public/ Community Consultations

Views and concerns from the residents, local leaders, surrounding institutions and development partners in Vipingo Mixed Use Development who in one way or another would be affected or have interest in the proposed Master Plan were sought through interviews, key stakeholder consultations and public meetings as stipulated in the Environmental Management and Coordination Act, (Cap 387). Stakeholders were consulted during screening, scoping, up to the SEA draft study. During the consultation process, the stakeholders were taken through the Master Plan including the objectives and possible impacts associated with implementation activities.

In general, the following steps were followed in carrying out the SEA public consultation process: -

- Identification and compiling a database of interested and affected individuals and institutions.
- Interview schedules were designed to different target groups and local community members in the proposed Master Plan.
- Public meetings in the villages/local centers and around the proposed mixed-use development area.
- Key Stakeholder Meetings at various levels and with different target groups in Kilifi County.

The public consultation and participation were conducted through:

1. Household socio-economic survey.
2. Key stakeholder consultation interviews.
3. Public participation meetings and 1st key stakeholders meeting. (conducted in 2016)
4. 2nd key stakeholder's consultation meeting. (conducted in 2020)
5. Public review of draft SEA Report (adverts published in June 2022)
6. Key stakeholders Validation meeting. (conducted in August 2021).

5.5.1 Household Interviews and Socio-Economic Survey

Household surveys were conducted within the entire neighbourhood of the proposed development. Survey tools were prepared for effective and systematic interviews by the environmental and socio-economic consultants assisted by a team of technical field assistants. The tools included structured and non-structured household interview schedules and key informant guidelines. Household interviews were conducted during the period of November 2015 running up to 2016

The purpose for such interviews was to identify the positive and negative impacts that have been studied in detail in chapter 6, 9 and 10 of this SEA report and subsequently promote proposals on the best practices to be adopted and mitigate the negative impacts respectively.

5.5.2 Public participation Meetings and the 1st Key Stakeholders Meeting

Consultative meetings were continuously held during the SEA exercise to deliberate on the issues affecting the proposed Vipingo Mixed Use Development Master Plan as well as capturing issues raised by various stakeholders. Four (4) public meetings and one (1) key stakeholder meeting were held on various dates in January 2016, with the local residents, Chiefs, Village elders, County Officials, National Government Agencies' representatives and other local administrative leaders in attendance. Invitation letters and notices were sent out and minutes were recorded during all the meetings *(Annex 2 - Public Meetings Notice and 1st Key Stakeholder Meeting Invitation Letter).* Further, meeting participants were registered (*Annex 3 – Public Meetings and 1st Key Stakeholders Meeting minutes and respective Attendance Sheets; list of Key informants and List of households interviewed.*).

Table 5-2: The summary of the registered number of participants at public meetings and 1st Key Stakeholders meeting, key informants Interviews and Household Interviews

S/N	Meeting venue	Targeted Groups/Villages	Dates and Time	Registered participants
1	***Vipingo Trading Centre, Crossroad Mwembeni Grounds***	▪ Business communities *(Shop keepers, Petrol Stations etc.),* ▪ Local CBOs ▪ Shariani Village ▪ Kijipwa Village ▪ Bureni Village ▪ Surrounding institutions (Schools, Hospitals and Financial Institutions) Local groups and churches	*Wednesday 6th January 2016* ***Time 10.00am***	*173*
2	***Rea Vipingo Plantations Headquarters / Vipingo Main Estate Area, Market Grounds***	▪ Vipingo Plantation Workers ▪ Business communities *(Shopkeepers, Petrol Stations, Sumra Dairy Farm etc.),* ▪ Surrounding institutions, ▪ Kambi ya Funza and nearby residents ▪ Residents of Kuruwitu Sub-Location, ▪ Residents of Rea Vipingo Estates, ▪ Residents of neighbouring residential areas (e.g., Vipingo Ridge) Kuruwitu Sub-Location administrative leaders	*Wednesday 6th January 2016* ***Time 2:30am***	*378*
3	***Takaungu Market, Takaungu Chief's Office Grounds***	▪ Shauri Moyo village, ▪ Timbuni village, ▪ Institutions *(Schools, Polytechnics and hospitals)* ▪ *Fishermen from the 2 beaches (*Kijanguani & Mwanamia*)* ▪ Local leaders and Administrators, ▪ Takaungu Market Centre ▪ Residents of Takaungu Location, Key Businesses and Investors within Takaungu Location (e.g., Mombasa Cement)	*Thursday 7th January 2016* ***Time: 10.00am***	*97*

S/N	Meeting venue	Targeted Groups/Villages	Dates and Time	Registered participants
4	***Kadzinuni, Mkongo Grounds***	▪ Makonde village, ▪ Kapecha Village, ▪ Mkomani village, ▪ Zoerani Kadzinuni village, ▪ Shauri moyo Kwa Kuruja nearby residents/ villages ▪ Local leaders and Administrators, ▪ Timboni Trading centre ▪ Surrounding Institutions (e.g., Schools and health centres)	*Thursday 7th January 2016* ***Time: 2.30pm***	*7**
5	***1st Key Stakeholder Meeting in Kilifi Town,*** ***Bofa Beach Hotel***	▪ Ministry Officials, ▪ County officials/Representatives, ▪ Lead Agencies, ▪ Local leaders and Administrators, ▪ Political Leaders, ▪ The Vipingo Mixed Use Development Design Team.	*Friday 8th January 2016* ***Time: 10.00am***	*29*
6	***Key Informant Interviews***	▪ County officials/Representatives ▪ Local CBOs and NGOs ▪ Local leaders and Administrators ▪ Surrounding Institutions (e.g., Schools and health centres) ▪ Business community ▪ REA Vipingo management and staff	*November 2015-January 2016*	*82*
7	***Household Interviews***	The following villages living in the Vipingo Sisal plantations were interviewed; Vipingo Main Estate, Vipingo trading centre, Shauri Moyo, Bureni and Kambi ya Funza among others. Those surrounding Rea Vipingo Sisal Plantations that were interviewed included; Shariani, Takaungu, Timboni Trading centre, Vipingo Petrol Station, Makonde, Kabeche, Takauni, Mukomani, Kadsinuni and the two beaches of Mwanamia and Kijanguani.	*November – December 2015*	*330*
	Total Registered Participants			*1096*

** The number that attended (see photos) were more than those that registered since registration was voluntary whereas others opted not to register.*

Below are plates of the initial public and key stakeholder's meetings that were held for the proposed Vipingo Mixed Use Development Master Plan.

The 1st Public participation meeting was held at Mwembeni Grounds, Vipingo Trading Center on Wednesday 6th January 2016.

Source: *AWEMAC Field Work 2016*

Plate 5-1: Public Disclosure of the Vipingo Master Plan

The picture below shows a Community member giving views during public participation meeting held at Mwembeni Grounds, Vipingo Trading Center on Wednesday 6th January 2016.

Source: *AWEMAC Field Work 2016*

Plate 5-2: Meeting at Mwembeni Grounds, Vipingo Trading Center

The picture below shows the Lead Consultant disclosing the Master Plan during the public participation meeting held at Vipingo Main Estate Area, Market Grounds on Wednesday 6th January 2016.

Source: *AWEMAC Field Work 2016*

Plate 5-3: Disclosing the Master Plan at Vipingo Main Estate Meeting

Plate 5-4 shows members of the Community airing their views and concerns during the public participation meeting held at Vipingo Main Estate Area, Market Grounds on Wednesday 6th January 2016. The meeting was majorly attended by Vipingo employees both on contract and permanent terms.

Source: *AWEMAC Field Work 2016*

Plate 5-4: Members giving views in the Vipingo Main Estate at Market Grounds.

The meeting held at chief's office grounds at Takaungu was well attended and members were able to air their views concerning the proposed Vipingo master plan. The picture below shows members keenly following the explanation of the master plan from the Lead consultant on Thursday 7th January 2016. It also shows a member of the community airing his views during the meeting.

Source: *AWEMAC Field Work 2016*

Plate 5-5: Public Disclosure of Master Plan at Takaungu chief's office grounds meeting

Source: *AWEMAC Field Work 2016*

Plate 5-6 A community member giving views during public participation at Takaungu chief's office grounds meeting

The picture below shows the Lead Consultant disclosing the proposed Master Plan during public participation meeting held at Kadzinuni, Mkongo Grounds on Friday 7th January 2016.

Source: *AWEMAC Field Work 2016*

Plate 5-7: Disclosure of Vipingo Master Plan at Kadzinuni, Mkongo Grounds

The 1st Key Stakeholders meeting was held at Bofa Beach Resort, Kilifi held on Friday 8th January 2016. The picture below shows stakeholders during the meeting.

Source: *AWEMAC Field Work 2016*

Plate 5-8: Key Stakeholders meeting on 8th January 2016 at Bofa Beach Resort, Kilifi County

5.5.2.1 Positive comments made by the respondents during initial 2016 meetings

Table below gives a highlight of the positive comments made by the respondents during the initial consultative meetings.

Table 5-3 Positive comments made by the respondents

Impact	Discussion
Employment Opportunities for the Locals	The respondents interviewed/consulted were optimistic that the proposed master plan development activities would create numerous employment opportunities for skilled, semi-skilled and unskilled labour during the various master plan implementation phases.
Poverty Alleviation	The respondents were positive that the proposed master plan development activities would reduce the poverty in Vipingo area and its environs due to improved income brought about by employment.
Increased Business Opportunities	The respondents and participants were optimistic that business opportunities would arise during construction of Vipingo Mixed-use Development
Increase in Land Value	Land rent and standard of living of the populace will increase due to high demand for space for urban development thus increasing the value of land and property within and surrounding the master plan.
Attraction of Investors	With the proposed master plan, investors will be attracted to invest their money in the proposed development through enterprises, business among others
Development of Infrastructure and Social Amenities in Vipingo Area	Respondents were optimistic that the proposed master plan development activities would improve infrastructure in the area.
Improved and Accessible Education	The respondents were optimistic that the proposed master plan development activities would improve the value of education in Vipingo Area and accessibility to research institutes
Better Healthcare	Respondents were positive that the proposed master plan development activities will improve health services in the area and it will reduce fatalities from curable diseases.
Improved Water Supply	The participants were optimistic that the water desalination plant would improve the availability of water in Vipingo area.
Improved Electricity Facilities	The participants were optimistic that the proposed connections to Kenya Power and Solar Power Plant would improve the availability of electricity in Vipingo area.
Improved Sanitation Facilities	Respondents commented that most households lack sanitary facilities and they were hopeful that with the development, there will be improved sanitation facilities due to the proposed integrated waste management plan.
Improved Security	The respondents were optimistic that the proposed master plan development activities will lead to improved security situation in the neighbourhood due to the numbers that will reside in the areas and the

Impact	Discussion
	possible synergistic effects that populated neighbourhoods bring along with them
Improved and Increased Housing in the Area	The development will attract better housing within Vipingo area since there would be high demand due to increased population. Better housing will be required in the proposed mixed-use development to cater for various classes of residents (high, medium and low income earners).
Improve Networking and Culture Exchange	The development will attract various people from different counties and countries and this will promote cultural integration of knowledge and exchange of a wide range of ideas.
Economic Growth / Increased revenue	The use of locally available materials and labour for the proposed master plan development activities will contribute towards growth of the local and national economies by contributing to the gross domestic product.
Decongestion of Mombasa City	Execution of the proposed master plan will massively reduce congestion in Mombasa and reverse traffic flows between Mombasa and Kilifi County
Promote Urbanization in Kilifi County	The execution of the proposed master plan will accelerate economic growth and serve as a catalyst for further urban development in Kilifi County and environs.

5.5.2.2 Negative impacts highlighted by the respondents during initial 2016 meetings

Table below gives a highlight of the positive comments made by the respondents during the initial consultative meetings.

Table 5-4 Positive comments made by the respondents

Impact	Explanation
Habitat loss, alteration and fragmentation of Land	The respondents were concerned that the proposed master plan development activities will result in alteration and disruption to terrestrial habitats. Construction activities may adversely affect habitats depending on the characteristics of existing vegetation and topographic features.
Environmental Degradation on change of land use	Respondents were concerned with the change of land use from agricultural land to a built environment. Conversion of land in the proposed master plan from sisal plantations to a mixed-use development will degrade the environment and alter the environmental conditions of Kilifi County. The clearance of sisal plantations, trees and vegetation cover for construction of the proposed development will have a negative impact to the environment through loss of biodiversity in the area.

Impact	Explanation
Noise Pollution and Vibrations	The residents expressed fear over noise and vibrations likely to occur during the execution of the master plan. They highlighted construction equipment and other moving machines in the construction sites
Air Pollution	The people expressed concern over possibility of generation of large amount of dust and fumes within the execution stage of the master plan. They noted that surrounding areas might encounter air pollution from excavation works and transportation of construction materials and industries. They were concerned that this may affect coconut plantations in the region.
Water Pollution	The residents feared that execution of the master plan would lead to increased population in the town, the streams and ocean would be polluted through sewage effluent and water from industries. This would also affect the quality of water that is being utilized by the locals in Vipingo Area.
Increased pressure on infrastructure	Some participants were concerned that due to magnitude of the proposed master plan, its execution will increase pressure on existing infrastructure such as roads, water supply system, waste handling facilities, electricity etc. This would be due to increased volumes on human and vehicle traffic along the access road.
Interference of Existing Development Infrastructure	The respondents also claimed that the execution of the proposed master plan would interfere with already existing infrastructure such as the pipeline, water pipes, power lines, roads and thus causing inconveniences.
Displacement of the Sisal Plantation Workers	The participants were worried that the proposed Vipingo master plan development activities would lead to displacement of workers within the REA Vipingo Plantations and loss of property in the area. Residents were worried that they would lose their homes.
Land conflicts & disputes	The community members complained about the transfer of leased land from Rea Vipingo Plantation Limited to Vipingo Development Limited. They pleaded that lease should be reviewed and the community compensated or re-allocated part of the land.
Loss of Jobs	The community felt that the Sisal Workers working at the sisal plantations would lose their jobs once the proposed master plan mixed-use development activities commences and this will have a localized impact on rural household economy.
The non-skilled are unlikely to get jobs	Respondents were concerned that only the skilled would have jobs during master plan execution phase leaving out the unskilled who are the majority in Vipingo Area
Increased Insecurity	There were concerns that due to an influx of many people during master plan execution phase, insecurity is likely to increase.
High Cost of Living for the Locals	Respondents were worried that execution of the master plan would result into high costs of living. They feared that they may not be able to

Impact	Explanation
	afford the services/amenities that will be provided by the proposed mixed-used development.
Interfere with culture and religion	Respondents were concerned that their culture and religion will be eroded with the introduction of foreigners in Vipingo Area. They expressed that their religion, beliefs and values may be lost while interacting with foreigners.
Increased Spread of Communicable Diseases	The respondents of Vipingo expressed concern that there would be emergence of new diseases such as HIV/AIDS especially during master plan execution. There would also be a possibility of social evils such as prostitution.
Increased Social vices	Some of the community members interviewed complained that the execution of the master plan might lead to emergence of social vices such as drug abuse, immorality, teenage pregnancy and crime.
Dumping of Solid Waste and oil spillage to the Ocean during execution of the master plan	The people expressed concern over possibility of generation of large volumes of waste during the master plan execution stages.
Destruction of Beach Line Corals and Mangroves during implementation phase	Some of the respondents who were members of a beach management unit expressed concerns over degradation of the mangrove trees at the shoreline. They feared that the proposed master plan land uses might have negative spill over effects to the beach line corals.
Emergence of informal settlements	The community members were also worried that such mega development envisioned by the master plan bring about informal settlements around the construction sites. That these informal settlements bring about disorder in the community, unplanned utilisation of social amenities and infrastructure. These kind settlements also decrease the aesthetic value of a place.
Competition for water resources and other utilities	The respondents feared that the proposed master plan land use developments would attract a high population in the area which would result to increased demand of water and other utilities. This is feared to bring about competition of resources against the increasing population

5.5.2.3 Recommendations highlighted by the respondents during initial 2016 meetings

The following suggestions were made during the initial consultations and house-to-house interviews: -

i. The developer to first sort out any land conflict issue in advance through County Government, National Land Commission and local communities.
ii. Ensure community empowerment with skills that will be required in the master plan execution.
iii. The developer to establish a participatory Corporate Social Responsibility (CSR) programme in consultation with local elected leaders and village elders. The CSR

programme to focus on provision of water, educational scholarships/ support, technical skills development especially those required in the construction sector, etc.

iv. The locals - especially the youth - to be given priority during implementation of development activities envisioned by the master plan.
v. Apart from establishing new institutions and social amenities, they should improve the existing ones.
vi. The community should be constantly involved and consulted to ensure fair opportunities during the implementation of the development of the master plan.
vii. The proponent should design a good waste disposal system to protect the environment from pollution.
viii. The proponent and REA Vipingo Plantations management should resettle/relocate the people/ squatters living in the proposed master plan area.
ix. Nepotism/tribalism not to be exercised during awarding of tenders and employment.
x. The developer to consider more of agricultural-based investments to create market for local agricultural products like coconuts.
xi. The contractor should ensure safety for workers and community.
xii. The developer should provide land for public facilities like institutions, roads, water, power, way leaves etc.
xiii. Local communities should be prepared through sensitization so that they can be encouraged to develop skills and knowledge for the upcoming Vipingo Mixed-use development.
xiv. The proponent should ensure mitigation measures proposed by local communities are implemented.
xv. The developer should ensure good siting for different zones/facilities to ensure sustainability.
xvi. The proponent should ensure the development incorporate the local community livelihood, culture and religion.
xvii. The developer should ensure education awareness is done, as majority of the local community are not educated.

5.5.3 2nd Key stakeholders Meeting held in December 2020

In order to ensure adequate public participation at draft SEA stage, a 2nd Key stakeholder's meeting was planned in the months of November to December 2020. Invitation letters were sent to the mapped stakeholders *(Annex 4 – List of mapped key stakeholders for Draft SEA meeting)* including key national agencies and Kilifi County government ministries, government departments operating in Kilifi, local representatives from the community amongst others who in one way or another are likely to interact with the proposed Vipingo Mixed Use Development.

The 2nd Key Stakeholders meeting invitation letters *(Annex 5 – 2nd Key stakeholders meeting invitation letter and programme)* were delivered to various stakeholders guided by a list of mapped key stakeholders. The 2nd Key Stakeholders meeting was held on Tuesday, 15th December 2020 at Bofa Beach Resort in Kilifi County. A comprehensive list of the 36 stakeholders who attended the key stakeholders meeting and the respective minutes are attached *(Annex 6i – 2nd Key Stakeholders meeting attendance sheet)* & *(6ii – 2nd Key Stakeholders meeting minutes)* respectively in this report.

Below is a highlight of key plates from the 2nd Key Stakeholders meeting held at Bofa Beach Resort on 15th December 2020.

Source: *AWEMAC Field Work 2020*

Plate 5-9 Vipingo MD presenting the proposed Masterplan

Source: *AWEMAC Field Work 2020*

Plate 5-10 KIMAWASCO officer giving comments on the Master Plan

Source: *AWEMAC Field Work 2020*

Plate 5-11 Kilifi NLC Coordinator giving remarks to the participants and SEA Consultants

Source: *AWEMAC Field Work 2020*

Plate 5-12 A local community woman representative highlighting her remarks

Table below highlights the key issues and the mitigation measures raised during the key stakeholders meeting. The outputs from the meeting have been incorporated in this SEA report.

Table 5-5 Key issues raised during the 2nd Key Stakeholders meeting

S/N	Key Issues Raised	Comments/ Issues/ Concern	Technical Team Response
1.	**Continuity for stakeholder's engagement**	▪ A local participant enquired whether there will be continuity in meetings to ensure issues raised are addressed.	▪ The SEA Consultant reported that Public participation and consultation is a continuous process that will continue even during specific projects development hence more meetings would be held. He informed that validation workshop will be organized in the next stage of SEA to ensure issues raised are incorporated.
2.	**Effects of Industrial Park to Climate Change**	▪ Mr. Juma Dickson from Kuruwitu CWA wanted to know how the development will manage the industrial park since industries are known to contribute gases (such as CO_2) that cause climate change	▪ The SEA Consultant noted that the Master Plan has set aside 30% of the land for green areas – recreational and green spaces. Further tree planting would be integrated in the development as set by the complete Awali Estate.
3.	**Effect of effluent (wastewater brine) from desalination plant to marine biodiversity**	▪ Mr. Juma Dickson from Kuruwitu CWA also noted that the 3 million water desalination plant was a good investment. He however expressed concern that the effluent from the desalination plant may affect marine biodiversity.	▪ Vipingo Development Ltd management explained that the effluent (wastewater brine) from the desalination plant would be diluted to normal concentration. He affirmed that the brine will undergo laboratory analysis and must meet NEMA discharge guidelines before discharge to the environment.
4.	**Impact on Beach Access and Turtle breeding areas.**	▪ Ms. Ntindi Kassim from KWS noted that the development is welcome as its in line with the Vision 2030. She appreciated that the project has considered wildlife. She echoed that it will be important to ensure beach access is provided for local community who depend on fishing and any mangroves are protected. ▪ Ms. Ntindi however enquired whether there were any turtle breeding areas identified? She further wanted to know measures and plans put in place for proper beach management due to expected population increase.	▪ The SEA Consultant noted that beach access will be provided as its also protected as public land by the constitution of Kenya 2010. He explained that a survey on wildlife was conducted and found that a section of the beach has a Turtle Breeding area. The beach section will be protected to conserve the turtle breeding, ensure access of local fishermen and no development is anticipated as per the master plan. ▪ The SEA consultant further noted that another section of the beach has a cliff and studies indicated no turtles can access the cliff section. ▪ Vipingo Development Ltd further added that Vipingo is willing to partner with KWS for enhanced beach management and protection. He noted that Vipingo plans

S/N	Key Issues Raised	Comments/ Issues/ Concern	Technical Team Response
			to also ensure beach cleaning and offer storage facilities for local fishermen.
5.	**Waste water management**	▪ Mr. Nicholus Nzioka the Director of Health Kilifi wanted to know the measures put in place for waste water management. He enquired about the stage of the plan, the type of treatment, location, capacity and future plans as the development grows.	▪ MD Vipingo Development Ltd noted that Vipingo has put in place a biodigester system to ensure waste water treatment. The effluent has been treated and tested to comply with NEMA standards on waste water. It is currently used for irrigation of lawns and green spaces in the development.
6.	**Solid waste management**	▪ Mr. Nicholus Nzioka the Director of Health further noted that solid waste is a huge problem for many towns and cities in Kenya and globally at large. He wanted to know the measures that have been put in place to manage solid waste.	▪ The SEA consultant noted that the draft SEA has recommended for integrated solid waste management (ISWM) (source reduction, separation, recycling, combustion and landfilling) for the development. He highlighted that based on the approach only minimal waste would end up in the Kilifi landfill.
7.	**Accessibility**	▪ Mr. Nzioka further appreciated the existence of road infrastructure and an airstrip nearby but enquired if there were plans to link the development with existing Railway network. ▪ He further enquired on whether there were plans to integrate the local popular bodabodas to the development through trainings and equipping them for higher services including provision of waiting bay shelters.	▪ The SEA consultant noted that the draft SEA has recommended for non-motorized transport facilities (NMT) – walking, cycling, skates, skateboards, push scooters etc. to be incorporated to the development. ▪ Vipingo Development Ltd explained that Vipingo envisions to develop a bus stop for ease of commuters and there are plans to support upgrade of the immediate local market. He also noted that Vipingo has a corporate social responsibility program that includes trainings for locals.
8.	**Building designs due to thermal overheating**	▪ The Director of Health also wanted to know measures that have been put on buildings designs and furniture due to the high temperatures experienced in the region.	▪ The SEA consultant noted that the green building technologies have been recommended in the draft SEA report. ▪ Vipingo Development Ltd explained that the development has incorporated certain green building technologies including tilted designs and tilted façade to reduce thermal overheating by sun.

S/N	Key Issues Raised	Comments/ Issues/ Concern	Technical Team Response
9.	**Supply of Water to Locals**	▪ Mr. Pascal Jira from Kilifi – Mariakani Water and Sewerage Company (KIMAWASCO) congratulated Vipingo for investment in the desalination plant. He enquired if there were plans for the desalination plant to expand storage facilities and supply water to Mtwapa and Kilifi. He highlighted that KIMAWASCO would be willing to engage in such partnership.	▪ Vipingo Development Ltd noted that there is a plan to have a pipeline of approximately 5.5 kilometres to give water access to the community at a subsided rate. He expressed noted willingness to such a partnership.
10.	**Blocked Access**	▪ A local participant wanted to know if an access road cutting across Vipingo Ridge would be opened up since the perimeter wall blocked their access.	▪ The SEA consultant explained that Vipingo Ridge is a different entity and separate from Vipingo Development Ltd. ▪ He explained that Vipingo Development will not be fenced but will have main access zones. ▪ Further he noted that the SEA team of experts will evaluate all gazetted KERRA and KURA roads within Vipingo development and ensure they are aligned with the master plan and protected for accessibility / use by the public
11.	**Maintenance of Infrastructure Within the Development / Life Span**	▪ A participant also wanted to understand who would be in charge of road maintenance within the development, government agencies (KERRA or KURA), County or private. ▪ The participant also wanted to know how long the roads would last.	▪ Vipingo Development Ltd explained that the roads are currently under private maintenance with residents contributing maintenance fees. ▪ MD Vipingo Development noted that the roads have a life span of 15 to 20 years.
12.	**Police Post / Security**	▪ Mr. Mathius Mzungu noted that the local police station is located far from the local village. He enquired if Vipingo Development has any plan to relocate local police post to close proximity with locals or possibly build a new police post. He also enquired if there were plans to improve on local villages.	▪ Vipingo Development Ltd noted that there were ongoing discussions with Ministry of interior Security - National Government on possibility of having a police post near Vipingo Development which would also serve the local community. ▪ The SEA consultant noted that Vipingo Development may consider liaising and partnering with National and County

S/N	Key Issues Raised	Comments/ Issues/ Concern	Technical Team Response
			Government including NGOs to improve the local villages. Key facilities would include roads, security, water provisions and school's (such as Rea Vipingo and Shauri Moyo) improvement programs.
13.	**Health and Safety / Salaries**	▪ Ms. Lilian Chari a local representative enquired on measures to be put in place for health and safety of employees. ▪ She also noted that there should be uniformity in salaries for support staff working in the development.	▪ The lead consultant explained that the SEA would recommend for a Labour Management Plan to ensure workers' labour rights including health and safety and are protected with fair remuneration.
14.	**Livelihood's for Sisal Farmers**	▪ Ms. Rose Mboti a local representative thanked Vipongo Development for their comprehensive CSR programme and noted that her child was a beneficiary. ▪ She enquired on the measures put in place to ensure livelihoods for sisal famers are not affected once the development take precedence over farming.	▪ The SEA consultant explained that community members and farmers from Rea Vipingo would be integrated in the Vipingo development through trainings. ▪ He also noted that Vipingo Development would be constructed in phases hence ensuring gradual adaptability of locals
15.	**Trainings For Youth**	▪ Ms. Dorris Barisa also thanked Vipingo Development for sponsorship programme noting her kid was a beneficiary. She wanted to know if there were provisions for training of local youth in skills such as domestic house manager to work in the development as opposed to hiring non-locals.	▪ The SEA consultant explained that the master plan has designated land use for development of hospitability facilities. Such facilities can be used for training local youth as domestic house managers to work in private homes. ▪ He further noted that Vipingo Development may consider a local short-term course program such as house management for training of local youth to work in the development
16.	**Measures to Deal ith Discrimination of Locals/ Labour Rights**	▪ Ms. Grace Kashihiri a local representative noted that Vipingo Development has brought immense benefits to the local area including being a beneficiary of employment. She enquired on measures that have been put in place to ensure no	▪ The SEA consultant noted that the SEA will recommend that all contracts with constructor's have a binding clause requiring a certain percentage of employees be locals. ▪ He highlighted through Vipingo Development the private security company would be encouraged to train and incorporate local employees.

S/N	Key Issues Raised	Comments/ Issues/ Concern	Technical Team Response
		discrimination of employment noting most of employees working in the Security are non-locals. ▪ Ms. Kashihiri further noted that Vipingo development should ensure all employees rights are protected including offering NSSF, NHIF and supporting staff to join Workers Union.	▪ Key labour rights as required by the Kenyan legislations including non-discrimination of gender, equal pay for work done, NSSF, NHIF and joining of Unions will be recommended in the SEA as part of the local recruitment / labour management plan.
17.	**Partnership with Learning Institutions**	▪ Mr. Eliud Denche the principle KMTC campus noted that before it was difficult for locals to access medical training. He explained opening of KMTC branch has ensured ease of access. He acknowledged Vipingo scholarship program and encouraged the management to continue supporting students up to college level. He noted that KMTC is willing to partner with Vipingo Development and offer opportunities to the locals.	▪ The management noted that are keen on ensuring basic attainment of education for all locals but are willing to partner and offer scholarships with KMTC for the locals' benefit. ▪ The MD Vipingo Ltd encouraged the locals to take advantage of opportunities arising in the area to improve their livelihoods. He noted that Vipingo development is offering a bridge to high school and the scholarship programme would expand once partners come in.

5.6 Public review and SEA disclosure

Upon submission of the draft SEA report to NEMA on 26th April 2021, NEMA undertook an administrative review of the Draft Report to ensure it is adequate to proceed with the stakeholder-review process. They later distributed the draft SEA report to stakeholders for comments.

Public review: NEMA prepared a summary of the SEA report (advert) and invited the public to make oral or written comments on the report at the cost of the proponent through the following media Channels:

- The Standard Newspaper on 7th June 2021
- Daily nation on 8th June 2021
- KBC radio on 11th June 2021
- Kenya Gazette on 11th June 2021

The invitation for public comments or 'the advert' stated -

- The nature of the Master Plan;
- The location of the area under Master Plan;
- The anticipated impacts of the Mixed-Use Development and the proposed mitigation measures to respond to the impacts;
- The times and place where the full report can be inspected; and
- The period within which the authority shall receive comments.

The public was given a maximum of 30 working days (from the date of the first advertisement) to submit comments on the Plan. NEMA also constituted a Technical Advisory Committee (TAC) that reviewed and provided independent technical comments on the Plan level SEA.

The purpose of the adverts were to allow all stakeholders to read and understand how they would be affected by the proposed mixed-use development. The stakeholders' comments have been incorporated in the Final SEA Report.

5.7 Key stakeholders Validation meeting

Following the submission of the draft SEA report to NEMA on 16th April 2021, the adverts were published in the Daily Nation of 8th June 2021, Standard newspaper of 7th June 2021, Kenya Gazette of 11th June 2021 and KBC radio on 11th June 2021 *(Annex 14- Newspaper Adverts)*. In view of the expiry of the public disclosure period, Vipingo Development Ltd in coordination with NEMA organised for a validation workshop that was held on 26th August 2021. The purpose of the meeting was to present and validate the draft Strategic Environmental Assessment (SEA) report for Vipingo Mixed Use Development Master Plan. The meeting also intended to receive oral or written comments from stakeholders to integrate environmental and social considerations into the Final Strategic Environmental Assessment (SEA) report of the Master Plan for purposes of ensuring its long-term sustainability. Invitation to the key stakeholder's workshop was guided by the stakeholder engagement plan with representation from various entities. A total of 44 participants attended the meeting. The minutes and list of participants for the Validation workshop meeting are annexed to this report *(Annex 15c &d*).

Source: *AWEMAC Field Work 2021*

Plate 5-13 Lead SEA Expert presenting SEA progress during the validation workshop on 26th August 2021 at Mnarani Club, Kilifi County

Source: *AWEMAC Field Work 2021*

Plate 5-14 NEMA HQ Representative, Mr. Reagan Owino presenting the SEA Process on 26th August 2021 at Mnarani Club, Kilifi County

Source: *AWEMAC Field Work 2021*

Plate 5-15 Attendees during the key stakeholders meeting held on 26th August 2021 at Mnarani Club, Kilifi County

Key issues and concerns raised during the key stakeholder's validation meeting have been summarized in *Table 5-6* below.

Table 5-6 Key issues, comments and concerns from the validation meeting

S/N	Key Issues Raised	Comments/ Issues/ Concern	Technical Team Response
1.	**NEMA Approval on ongoing developments.**	• Dr. Levy Otwomwa from KMFRI wanted some clarification on whether the developer is supposed to await approval of the masterplan by NEMA before commencing any development. • He also sought to know whether the ongoing developments have acquired NEMA Approval.	• NEMA DG Representative clarified that SESA can be carried out in 3 stages: After coming up with a plan and want to proceed with implementation stage; before implementing a plan; while preparing and implementing the plan at the same time where Vipingo Development Ltd Master Plan lies. • Individualized EIA was done for each project and NEMA Approval obtained. • Vipingo Development Limited representative confirmed that all projects obtained NEMA and National Construction Authority (NCA) Approvals.
2.	**Closure of Access road across Vipingo Ridge**	• Prof. Josphat Mwatele, CEC Lands and Public Works, Kilifi County wanted to know why an access road cutting across Vipingo Ridge and serving the community in Mbirikani was closed. The public is not allowed to pass through the ridge.	• Mr. Japhet Koech from KeRRA, Kilifi County noted that the private developer has no right to close a public facility or road. • Vipingo Development Ltd representative confirmed that Vipingo hasn't closed access to any public road nor fenced the project area. He assured NEMA that they were free to pick up with the developer that had closed any public access road. • The GoK roads staff present confirmed that the closed access road is a private road. The proponent will work on ensuring easy access for communities located behind Vipingo ridge. • The Consultant further noted that the GoK roads agencies team of experts will evaluate all gazetted KERRA and KURA roads within Vipingo Development and ensure that they are aligned with the Master Plan and protected for accessibility / use by the public.

3.	**Adherence to minimum standards for roads and storm water design**	• Mr. Japhet Koech from KeRRA wanted to know whether the developer had adhered to the minimum standards for roads and storm water design i.e factored in storm waters, and road reserve while developing the master plan.	• Vipingo Development Limited has employed a Storm/ drainage water engineer that works with the team in each project. • The SEA Lead Consultant noted that the SEA team of experts has recommended for a Storm Water Management Plan in the Final SEA Report. The issue would be integrated as a recommendation in consultancy with the national and county government and as per set standards.
4.	**Human Traffic Management**	• Mr. Japhet Koech from KeRRA sought to know whether the developer had a plan to construct bypasses due to expected increase of traffic in the area once the masterplan has been implemented. • He also inquired on whether the developer had come up with mitigation measures to minimize human traffic and road accidents.	• Vipingo Development Limited representative confirmed that the developer has done a Traffic Impact Assessment Study for the development. The Master Plan entails a bypass of a 60km stretch from Mombasa town to Vipingo. He also noted that the road designs have a lifespan of up to 30 years. • The SEA Lead Consultant noted that the SEA Team of experts would recommend for a Traffic Management Plan in the Final Strategic Environmental Assessment Report.
5.	**Fire Control Plan**	• Mr. Japhet Koech from KeRRA wanted to know whether the developer had a plan to construct a fire station within the development.	• The SEA Lead Consultant noted that the SEA Team of experts would recommend for a Fire Control Plan in the Final Strategic Environmental Assessment Report. • The developer has incorporated the provision of 24 hours medical and emergency facilities such firefighting facilities and ambulances in the Master Plan as part of the support trunk infrastructure.
6.	**Consideration of small scale farmers in the Manufacturing Agenda**	• Ms. Sharon Bahati representing CECM Agriculture, sought to know whether the Manufacturing Agenda had considered small scale cashew nut farmers.	• Vipingo Development Limited representative noted that the developer will consider buying cashew nuts from small scale farmers once the factory is in operation.
7.	**Land use**	• Mr. Silvano Inyangala from Superior Homes Kenya Plc wanted to know what investment would be developed between Palm ridge and Awali Estate.	• Vipingo Development Ltd representative noted that land between Palm ridge and Awali Estate would be utilized as a mixed use development.

8.	**Solid Waste Management**	• Ms. Mildred Akoth from County Government of Kilifi – Environment department noted that solid waste management is a huge problem in Kilifi County given that the dumping sites in the area are full. • She wanted to know measures that have been put in place by the developer to manage solid waste and if Vipingo Development Limited had plans to create its own sanitary landfill.	• Vipingo Development Ltd representative reported that only 26 acres of the land had been developed which produces approximately 400 units of waste per day that doesn't warranty for a landfill. They have contracted licensed waste management companies to collect, recycle and dispose their waste. • He also confirmed that a landfill site has been factored in the Master Plan and will be implemented once they start producing enough waste.
9.	**Access to employment and Scholarship opportunities**	• One of the local participants, Ms. Esther Chibuye Kapeche requested the developer to raise awareness on the available employment & scholarship opportunities and ensure the information is dispatched to all communities around the project area. • She also suggested that the developer should consider both the illiterate and literate for available employment opportunities.	• The SEA Lead consultant noted that the developer had created over 1,500 employment opportunities. Some of the jobs are created indirectly by creating business opportunity for local people e.g. selling food to employees working for Vipingo Development Ltd. • Vipingo Development Ltd representative confirmed that 70% of employees at centum are women. The developer will enhance their communication channels so as to ensure information on available employment and scholarship opportunities is disseminated to all communities. • He also noted that the employment opportunities factor in both the literate and the illiterate.
10.	**Public Sensitization on Cashew nut Farming**	• Ms. Lilian Chari, a local representative requested the developer to sensitize the local community on cashew nut farming since some of the farmers are cutting down their cashew nut trees. • She also requested the developer to assist in supplying the farmers with cashew nut seedlings.	• Vipingo Development Ltd representative confirmed that they would sensitize the public on the need to maintain and grow more cashew nut trees. • He also noted that County government and other willing agencies can offer support by providing seedlings to the local communities.
11.	**Effect of extracting large**	• Mr. Juma Dickson from Kuruwitu CWA also noted that the 3,000,000 litres of water	• Vipingo Development Ltd representative noted that the developer aims to abstract saline water from boreholes

	volumes of water from the Indian Ocean for the desalination plant.	desalination plant was a good investment. He however expressed concern on effects of extracting high volumes of water from the Indian Ocean.	drilled near the Indian Ocean to produce fresh water for domestic and industrial use. Extraction of 3,000,000 litres of water per day from Indian Ocean will have a minimum impact on the Ocean.
12.	**Effects of Industrial Park on Climate Change**	• Mr. Juma Dickson from Kuruwitu CWA wanted to know how the developer will manage the industrial park since industries are known to contribute gases (such as CO_2) that cause air pollution which in turn contribute to climate change. He also sought to know whether the developer would plant more trees in the area to act as carbon sinks.	• The SEA Consultant noted that the Master Plan has set aside 30% of the land for green areas – recreational and green spaces. Further tree planting would be integrated in the development. • The SEA Lead consultant noted that the proponent is committed to implementing measures that shall reduce emission of greenhouse gases and air pollution in general from the proposed development master plan activities. Such measures include; use of renewable sources of energy such as wind, solar energy; adoption of clean production mechanism; adoption of green building technology; adoption of air quality policy that binds developments such as industrial sector to pollution control and adherence to Air Quality Regulations 2014.
13.	**Gazettement of Public roads and transfer of Public Utilities**	• Ms. Umi Ntonya Kuguka from the National Lands Commission (NLC) enquired whether the developer has identified public roads for gazettement. • She also sought to know if transfer of subdivisions for public utilities had been done and documentation obtained.	• The SEA Lead consultant noted that gazettement of public roads will be carried out by KURA and KeRRA depending on the class of the roads. The developer has allocated money to cater for the process. • Vipingo Development Limited representative noted that public utilities are defined by extent of ownership of property. Vipingo Development Limited has primary ownership in masterplan and not subdivision.
14.	**Pending land compensation Claims at court**	• Ms. Umi Ntonya Kuguka from the National Lands Commission (NLC) noted that there were pending claims at the court on historical land injustice and compensation of communities following displacement.	• The SEA Lead Consultant reported that alternative land dispute measures can be used to solve the pending claims. The affected parties can visit the developer's office and register the claim. • The SEA Team of experts has recommended that the developer should ensure grievance redress procedures are in place to allow affected people to lodge a complaint

			or a claim without incurring any cost and with the assurance of a timely and satisfactory resolution of that complaint or claim.
15.	**Access to NEMA Approved Reports.**	• Mr. Moses Gunda Chief Officer Urban Planning, Kilifi County sought to know whether Environmental Impact Assessment (EIA) reports for NEMA approved projects have been shared with the County Government.	• The SEA Lead consultant noted that all Environmental Impact Assessment reports for Approved projects are available to public and can be accessed from NEMA Website (www.nema.go.ke) under "Downloads – EIA/SEA Reports "section.
16.	**Social Welfare Services**	• Mr. Mwangome Cyrus, Director Gender and Youth sought to know whether Social welfare Services had been factored in the masterplan (under public utilities) to avoid street families.	• The SEA lead consultant noted that provision of social welfare services such as a children's home/social rehabilitation centre would be accommodated in the 15% land section allocated for public spaces.
17.	**Effect of effluent (wastewater brine) from desalination plant to marine biodiversity**	• Dr. Peary Kilei form Mount Kenya University -Malindi Campus sought to know how the developer is going to handle residue produced from the desalination plant that may affect marine biodiversity.	• Vipingo Development Ltd representative reported that the desalination plant technology had been used in Dubai and proved to be efficient. Water extracted from the ocean is treated and disposed within the plant system. • He further explained that the effluent (wastewater brine) from the desalination plant would be diluted to normal concentration. He affirmed that the brine would undergo laboratory analysis and must meet NEMA discharge guidelines before being discharged into a borehole. No direct discharge will be made to the ocean.
18.	**Baseline Study of the Ocean Ecosystem**	• Dr. Levy Otwoma noted that changing land use from Agricultural to mixed use development might lead to increased soil erosion, storm water generation and sedimentation. He advised the developer to conduct a baseline study of the ocean ecosystem to identify impacts.	• The SEA lead consultant noted that SEA team of experts would recommend for a baseline study of the ocean ecosystem in the Final Strategic Assessment Report.
19.	**Livelihood of Sisal Farmers**	Ms. Joyce Wangulu from Kadzimuni village enquired on the measures that had been put in place to ensure livelihoods for sisal famers are	• The SEA consultant noted that Vipingo Development would be constructed in phases hence ensuring gradual adaptability of locals. Phase 1 of the Master Plan will be

		not affected once the development takes precedence over farming.	developed on open spaces and is likely to take 30 yrs. Phase Two will be developed on the Sisal plantation but the process will be gradual. • Vipingo Development Ltd representative further noted that only 26 of 10,254 had been developed over span of 6 years (2015-2021). This shows that the development will be a gradual process.
20.	**Public/ Local Community Sensitization Meetings**	• A local participant requested for more public/local community sensitization meetings on the proposed masterplan.	• The SEA Consultant reported that public participation and consultation is a continuous process that will continue even during specific projects development hence more meetings would be held. The local community will be involved in each section of the development.
21.	**Integration of Non-Motorized Transport**	• Prof. Josphat Mwatele, CEC Lands and Public Works, Kilifi County wanted to know whether Non-motorized transport had been factored in the plan.	• The SEA Consultant confirmed that Non-motorized transport had been integrated in the plan.
22.	**Expansion of scholarship programme to tertiary institutions.**	• Dr. Pearly Kilei sought to know whether the developer can expand the scholarship programme to cover tertiary institutions.	• Vipingo Development Limited representative noted that Vipingo development is currently offering a bridge to high school and the scholarship programme would expand once more partners come in. • The SEA lead consultant advised the developer to partner with local partners like Equity bank, Safaricom foundation and bring on board more supporters.
23.	**Dumping of Waste at the Project Site**	• One of the local participants sought to know how the developer is going to address the issue of waste dumping within the farm. Medical Waste is evident at the project area.	• Vipingo Development Limited representative noted that due to failure to fence the projects area, there has been increased waste dumping in the area. The developer will come up with a plan to address the issue.

24.	**Illegal Livestock Grazing**	• One of the local participants sought to know how the developer is going to address the issue of illegal livestock grazing at the Project area.	• Vipingo Development Limited representative noted that due to failure to fence the projects area, there has been illegal livestock grazing at the area. The developer will come up with a plan to address the issue.
25.	**Alternative Sources of Water**	• Mr. Geoffrey from Water Resources Authority (WRA) wanted to know whether the developer had considered alternative sources of water for the development other than the desalination plant and underground water.	• The SEA lead Consultant noted that developer had incorporated the use of alternative sources of water such as roof catchment rainwater harvesting and harvesting of flood waters.
26.	**Alternative Sources of energy**	• Mr. Geoffrey from WRA sought to know whether the developer had considered alternative sources of energy such as solar systems in the plan.	• The SEA Lead Consultant noted that the Masterplan had incorporated solar energy as an alternative source of energy. It is estimated that 750 acres (7%) will contain utilities such as electrical generation and distribution, solar power plant, drinking water treatment plant, wastewater treatment plant and solid waste.

6 IMPACTS IDENTIFICATION AND ANALYSIS

6.1 Introduction

The environmental baseline information, stakeholder engagement and the proposed Vipingo Mixed Use Development as envisioned by its master plan characteristics discussed earlier, form the basis for impacts identification and evaluation. Further literature review of published reports, scientific papers and other approved SEAs was conducted by the team of experts to provide a complete list of anticipated impacts. The impacts that are expected to arise from the Master Plan execution could either be termed as positive, negative, direct, indirect, short-term, long-term, temporary, and/or permanent depending on their area of cover and their stay in the environment.

This chapter gives a highlight of impacts analysis. Prediction and evaluation of impacts, including cumulative effects have been clearly documented including trade-offs. The positive and negative impacts likely to originate from the execution of the proposed Master Plan are described based on social, biophysical environment and the economic aspects.

6.2 Impacts analysis and Quantification of the Magnitude based on Leopold Matrix

For the analysis of possible impacts of certain activities and procedures during the implementation of Vipingo Mixed-Use Master Plan and its exploitation on the environmental elements, several possible factors, which are actually activities on the realization of the Master Plan, have been singled out from a wider list of potential factors of impacts that can be expected for such type of interventions in nature. Although it is possible to partially determine aggregate, i.e. average assessment of impact factors for each of these components, the study considers that it is sufficiently appropriate and functional to present them. The fact is that some of them are synergistic ones, mutually reinforcing their effects, so that this matching of information should be maintained in the analysis. A synthetic presentation of endangering factors is given through mean values and not through aggregate assessment.

Impact factors have been evaluated separately for each environmental component relevant for the scope of this study, where (-) is for a negative effect, (+) is for a positive effect and scored on a scale from 0 to 5 for impact magnitude, according to the following scale:

0 – No observable effect.
1 – Low effect;
2 – Medium low effect;
3 – Medium high effect;
4 – High effect;
5 – Very high effect.

Leopold matrix has been chosen as a suitable method of impacts analysis. There are several major reasons why precisely this approach has been chosen as appropriate for further environmental assessment of the Vipingo Mixed-Use Master Plan:

- The Leopold matrix presents a framework approach to impact assessment of a plan because it is possible to creatively work on its further development.
- It is widely applicable in carrying out an Environmental Assessment for different types of plans and projects.
- Widely used and its major principles are known to scientific and professional circles, thereby implying that the elaboration of the obtained results will be understandable to many scientists and experts.
- Results are presented in an appropriate way befitting the existing problems in the realization of Vipingo Mixed-Used Master Plan in Kilifi County. In this approach, the descriptive and rough assessment of possible impacts is avoided.

Table 6-1: Matrix of magnitude of the impact of factors on environmental components for Vipingo Master Plan

Envisaged Impact Factors (IF)				ACTIONS [Proposed actions which may cause environmental impact]												
				Modification of regime				Land transformation and construction					Resource extraction		Sum of IF values by types	Average values
				Modification of habitat	Alteration of ground cover	Surface or paving	Noise and vibration	Urbanization	Industrial sites and buildings	Roads and trails	Barriers including fencing	Recreational Sites	Surface excavation	Land Clearing		
FACTORS [Existing characteristics and conditions of the environment]	**Physical characteristics**	**Earth**	**Soils**	-3	-2	-1	0	-2	-2	-2	0	-1	-4	-4	-21	-1.91
			Land form	0	0	0	0	-1	-1	0	0	0	-2	0	-4	-0.36
		Water	**Ocean**	-1	-2	-1	0	-3	-4	0	0	0	0	-2	-13	-1.18
			Ground	0	-3	-3	-1	-2	-3	0	0	0	-3	-3	-18	-1.64
			Quality	0	-3	0	-1	-3	-4	0	0	0	-3	-3	-17	-1.55
		Processes	**Floods**	0	-3	-4	0	-2	-2	0	-3	0	-2	0	-16	-1.45
			Erosion	-2	-4	0	0	-2	0	-1	0	0	-3	-5	-17	-1.55
			Deposition (sedimentation)	-1	-4	0	0	-3	-3	0	-1	0	-2	-4	-18	-1.64
	Biological	**Flora**	**Trees**	-3	-4	-1	0	-3	-4	-1	0	-1	-4	-5	-26	-2.36

	conditions														
			Shrubs	-3	-4	-3	0	-4	-4	-3	-1	-1	-4	-5	-31	-2.82
			Grass	-1	-4	-5	0	-4	-4	-3	-1	-1	-4	-5	-31	-2.82
			Crops	-1	-4	-5	0	-3	-4	-1	-1	-4	-4	-5	-32	-2.91
			Aquatic plants	-3	-2	0	0	-3	-3	0	0	0	0	-1	-12	-1.09
		Fauna	**Birds**	-2	-2	-1	-1	-2	-2	0	0	0	-1	-2	-13	-1.18
			Land animals, including reptiles	-5	-4	-4	-4	-4	-4	-1	-2	-1	-3	-4	-36	-3.27
			Fish and shellfish	-5	-2	-1	-1	-3	-3	0	0	0	0	0	-15	-1.36
			Benthic organisms	-5	-1	-1	-1	-3	-3	0	0	0	0	0	-14	-1.27
			Insects	-3	-3	-2	-3	-2	-2	0	0	0	-2	-2	-19	-1.73
			Micro-fauna	-2	-4	-4	-2	-3	-4	0	0	0	-5	-2	-26	-2.36
	Social-cultural factors	**Land use**	**Agriculture**	-4	-5	-5	-2	-5	-5	-3	0	-5	-5	-5	-44	-4.00
			Commercial/ Business	+4	+5	+5	0	+5	+5	+5	+5	+5	0	+5	+44	4.00

		Cultural status	**Cultural patterns (life style)**	0	-2	-2	-2	+5	+5	+3	+3	+5	-2	-2	11	1.00
			Health and safety	-1	-1	-2	-3	-3	-3	+2	+5	+3	-4	-1	-8	-0.73
			Employment	+5	+5	+5	0	+5	+5	+5	+3	+4	+2	+5	+44	4.00
			Population density	+5	+5	+5	-1	+5	+5	+5	+5	+5	0	+5	+44	4.00
		Ecological relationships	**Eutrophication**	0	-3	0	0	-3	-3	0	+4	0	0	-4	-9	-0.82
			Disease-vectors	0	-2	0	0	-3	-2	0	0	0	0	+4	-3	-0.27
			Food chains	-4	-4	-3	-1	-3	-3	-1	-1	0	-1	-4	-25	-2.27
Cumulative values of IF according to environmental factors				-35	-57	-33	-23	-49	-52	4	15	8	-56	-49		
Average				-1.25	-2.04	-1.18	-0.82	-1.75	-1.86	0.14	0.54	0.29	-2.00	-1.75		**IF= –1.06**

6.3 Elaboration of the Assessed Effects of Impact Factors on Environmental Components

6.3.1 Physical Characteristics

The subject master plan will affect soil during the implementation stage. Clearing of some of the sisal plantation to pave way for construction activities may expose the soil at site to agents of erosion such as wind and water. Areas where excavations will be carried will also be prone to erosion processes. The total average value of magnitudes of expected impacts of implementation stage of the subject Vipingo Mixed Use Master Plan on soil is within low effects (-1.91) of local character. Furthermore, the project will not affect landform significantly. The total average value of magnitudes of expected acts of the plan on landform is within low effects (-0.36).

As for possible impact on the Indian Ocean, it can occur primarily because of presence of industries in the area with inadequate waste material treatment during their operation phase. The total average value of expected impact magnitudes on the Ocean is within low effects (-1.18). With regards to groundwater and water quality, certain negative effects of the plan can occur during master plan implementation. Oil leaks and spills from construction equipment may occur which may leach through the ground surface to contaminate groundwater. During operation stage, impact may mostly occur from industries with inadequate liquid waste management system, which may result to wastewater contaminating water sources in the area. The total average value of expected impact magnitudes on groundwater and water quality, respectively, is within low effects (-1.64) and (-1.55).

Certain negative effects of the Vipingo Mixed Use Master Plan can occur on physical processes. Floods being one of these processes may result from surface paving and an increase in buildings in some of the proposed zones. This leads to limited percolation rates during the rainy seasons. Barriers such as walls may also result to floods depending on slope gradient of a given area in correlation to a barrier, however, this will not be significant considering the plan is envisioned to be like city with few barriers and/or fencing to enhance public access. The total average value of expected impact magnitudes of the plan on floods is within low effects (-1.45).

Impacts on erosion processes in the proposed plan area will be because of similar acts and/or process as those affecting soil as mentioned above. The total average value of expected impact magnitudes of the plan on erosion is within low effects (-1.55). Sedimentation may occur on the nearby coastline as result of increased storm water flow. Developments of most of the proposed zones increases impermeable surfaces thus when rain falls, where drainage systems are inadequate, storm water resulting will flow towards the low altitude area, the Indian Ocean, carrying with it eroded materials mostly comprising of soil. The total average value of expected impact magnitudes of the plan on deposition is within low effects (-1.64).

6.3.2 Biological Conditions

Proposed Vipingo Mixed Use Master Plan activities that will alter land cover such as land clearing, excavations and construction of buildings will most likely result to loss of some of the species of baobab trees within the project area to pave way for construction. The total average value of expected impact magnitudes of the plan on trees is within medium low effects (-2.36). The same shall apply to shrubs and grass which have a total average value of expected impact magnitudes within medium low effects (-2.82). However, after making suggestions to the investor on the importance of trees found in the location, the proponent is keen on preserving almost all of the baobab trees within the plan area and establishing afforestation programmes to plant more trees within the proposed master plan, thus the total risk of losing trees in the location is negligible. There are no forest plantations within the proposed area for master plan development. Forest plantations in the neighbourhood will not be affected, where impacts may occur due to spill over effects will be very minimal.

Crops will be the most affected biological aspect. The proposed plan area is entirely a sisal plantation. Most of this plantation will be cleared to pave way for construction except in the undeveloped parcels and agricultural pockets within the master plan. The total average value of expected impact magnitudes of the plan on crops is within medium low effects (-2.91).

Mangrove trees found at some parts of the Indian Ocean coastline, in the neighbourhood of the proposed project, may be prone to spill over effects from the proposed Vipingo Mixed Use Master Plan such as eutrophication, deposition at the coastline and coast line pollution coastline pollution due to inadequate waste management from the proposed plan during operation phase. The total average value of expected impact magnitudes of the plan on aquatic plants is within low effects (-1.09).

Considering that the proposed plan area is extensively a sisal plantation with few habitats for birds, it is rare to come across birds or birds' nests. However, forest plantations in the neighbourhood have provided suitable habitat for a few birds' species. No Important Bird Area is at or near the proposed plan area. The proposed plan area is also not a migratory corridor for any birds' species. In the location, no significant negative impacts have been assessed. The numerosity of birds is relatively small, of which there are no significant effects on them. On the other hand, it is also necessary to emphasize the assessment of possible positive impacts of the Vipingo Mixed Use Master Plan implementation, as well as the construction of accompanying infrastructure, on certain species of birds. The total average of magnitude of expected impacts of the subject plan on birds is within low effects (-1.18).

Based on analysed data on the presence of land animals including reptiles, it can be concluded that the greatest impact of the implementation of the Vipingo Mixed Use Master plan will be on rats and snakes. These being the most common animals to have established niches within the sisal plantation. The rats find food from the sisal plantation while the few snakes within the area prey on them. Clearing of most of the sisal plantations for the master plan development to take place will lead to loss of habitat to the rats. This will result to a spin-off negative effect to the snakes which will experience food shortage due to depletion of rats. The total average of magnitude of expected impacts of the subject plan on land animals is within medium-high effects (-3.27).

As for fish, shellfish and benthic organisms, implementation phase of the proposed master plan may result to negative spill-over effects in the ocean which may disturb their existence. Pollution of the Indian Ocean from waste materials, more so plastics, and wastewater from developments on the Eastern part of the proposed plan area, may make it inhabitable for aquatic animal species. These impacts are however, proposed to be mitigated through establishment of sound management systems proposed in the Environmental and Social Management & Monitoring Plan. The total average value of expected impact magnitudes of the plan on fish & shellfish and benthic organisms is within low effects respectively (-1.36) and (-1.27).

Insects such as ants and grasshoppers found within the sisal plantations may decrease in number especially through the proposed plan activities during implementation stage. This includes activities which may result to modification of their habitat and alteration of ground cover including land clearing. The total average value of expected impact magnitudes on insects is within low effects (-1.73). The same activities will also affect the micro-fauna within the proposed plan area. Surface excavations will intensify the negative effects on them. Other processes which may be brought about by the proposed Vipingo Mixed Use Master plan such as soil erosion will lead to their reduction. The total average value of expected impact magnitudes on micro-fauna is within medium-low effects (-2.36).

6.3.3 Social-Cultural Factors

The most negatively affected factor by Vipingo Mixed Use Master Plan is agriculture. The whole proposed plan area is extensively under sisal plantations except for open spaces where sisal has been harvested. Most of the sisal plantations will have to be cleared except for undeveloped

parcels and agricultural pockets/zone. Thus, agriculture being the main activity on the proposed plan area will be highly impacted negatively. The total average of magnitude of expected impacts of the subject plan on agriculture is within high effects (-4.00).

One of the main objectives of this master plan is to improve business/commercial activities in the region and beyond. A zone has been dedicated for commercial purposes to increase the ease of doing business in the area. Apart from commercial agriculture, not much business activities have been witnessed in the area and its surrounding. The total average value of expected impact magnitudes on commercial activities is within high effects (+4.00).

The life style of the local community will definitely be affected. This factor will be affected both positively and negatively. For instance, clearing of most of the sisal plantations for surface excavations, paving and construction of buildings will lead to loss of jobs to most of the sisal plantation workers. Loss of employment to most of the sisal farmers may lead to hardships and depreciating life styles. On the other hand, the proposed Vipingo Mixed Use Master Plan activities during both the construction and operation phases will provide vast employment opportunities to the local community including the sisal plantation workers. This will entail unskilled, semi-skilled and skilled labour opportunities in the various proposed zones including the agricultural pockets. As a result of a mix of both positive and negative effects, the total average of magnitude of expected impacts of the subject plan on cultural patterns is within low effects (+0.73). This is, however, expected to rise positively with implementation of the proposed master plan.

The risk of accidents and/or hazards on both employees and local community members is small. In the subject location, there is no immediate danger for population. There are very few residential settlements in the proposed plan site that will for a very long time be preserved. The shown positions of proposed zones in the master plan have been carefully chosen, considering that the few existing residential settlements of the sisal plantation workers will form part of the residential zone. It is also significant to note that the industrial zone has been located far from the residential zone. A few accidents may occur during the construction period of various developments. Mitigations for the community and employee's health and safety have been provided in this report's environmental and social management & monitoring plan. The total average value of expected impact magnitudes on health and safety is within low effects (-0.73).

The proposed master plan is envisioned to create numerous and various employment opportunities to the local community members. This includes in both the construction and operation stages of the proposed master plan. Jobs will vary depending on skill set required. The proponent is encouraged to ensure about 70% of the available employment opportunities are given to the locals. Availability of employment opportunities, residential units, places to do business, institutions and industries will attract people to Vipingo area. People will move to the proposed plan area in such of opportunities hence increasing the population of the area. The total average of magnitude of expected impacts of the subject plan on employment and population density is within high effects (+4.00).

Eutrophication may result during alteration of ground cover and land clearing in construction stage where storm water carries the top soil together with its nutrients to the Indian Ocean coastline. This may also result from surface paving which results to increase surface run-off and from buildings with inadequate waste management systems. The total average value of expected impact magnitudes on eutrophication is within low effects (-0.82). Disease vectors may also increase due to inadequate waste management systems. Excavations may also lead to their increase especially when it rains and storm water forms pools attracting insects such as mosquitoes. The total average of magnitude of expected impacts of the subject plan on disease vectors is within low effects (-0.27). The proposed Vipingo Mixed Use Master Plan will affect food chains. Alteration of habitats, land clearing and changing ground cover will result to certain species being exposed and others moving away leaving their predators in challenging conditions to get food. This however has a low total average value of expected impact magnitudes (-2.27) as the proposed area has been under human modifications having few animal and plant species.

6.4 Positive Impacts on the Physical Environment

6.4.1 Optimal Use of Land

Currently, the land proposed for the Vipingo Mixed Use master plan is under large-scale agriculture specializing in sisal production. The proposed master plan will fully utilise the available land economically to benefit the locals, county government and the national government through the returns earned from various operations in the Mixed-Use Development. Land is a precious resource in Kenya and optimized land use is encouraged. Such utilization will not only benefit the proponent but also the residents, local authority, among others. When the proposed development is complete and executed as per the master plan, a lot of economic returns will accrue from mixed development activities compared to the current gains from sisal farming. In economic terms, the proposed development is more profitable in the long-run.

6.4.2 Landscaping and Improved Aesthetic

Implementation of the proposed Mixed-Use Development, under Vipingo Development Masterplan, will involve carrying out landscaping activities in different zones of the proposed mixed-use development. There are various land uses in the area, but majority of the area is currently occupied by a sisal plantation. In addition, there are local villages (settlements) within the proposed development including Vipingo Estate, Shauri Moyo, Pureni and Kambi ya Funza among others. Execution of the planned developments together with the green parcels and parks will make the site more interesting, appealing, and aesthetically attractive resulting in a significant positive impact. This will greatly improve visual landscape beauty of the proposed area for master plan implementation.

6.5 Negative Impacts on the Physical Environment

6.5.1 Degradation of Air Quality

Implementation of the master plan will leave a significant footprint at the coastal region. Plants are the only natural sinks of CO_2 which is one of the key greenhouse gases. Currently, the land proposed for development is under sisal plantations which absorbs substantial amount of CO_2. Land conversion from sisal plantations to mixed use development will not only remove the CO_2 natural sink but also introduce development activities that are expected to emit several greenhouse gases such as CO_2, methane, sulphur, Nitrous oxide, halocarbons amongst others. The development of Vipingo Mixed-use Development will lead to an increase in Green House Gas emissions thus contributing to climate change. The main sources of Green House Gases in the proposed Vipingo Mixed-use Development will be:

- Increased energy demand thus increased combustion of fossil fuels to generate the electricity demanded
- Increases emissions from the electricity used for cooling and heating in the residential and commercial buildings
- Increased transport activities due to increased population
- Pollution/ Emission from industries
- Emission from waste as a result of increased generation

Upon completion of the development, the most likely sources of air pollution include emissions from housing development, industrial, educational, sports facilities, commercial infrastructure, transportation, and agriculture (Table 11.2). Key pollution points would be standby generators, motor vehicles and kitchen fires. Other potential sources would be from incineration on site, and odours from sewer treatment plants/waste transfer sites.

Table 6-2Sources of air pollution

Sector	Sources of air pollution
Agriculture and food	Land-based farming, food and agro-industry,
Energy	Combustion plants, fossil fuels, biomass, nuclear, domestic solid fuel heating
Industrial	Chemicals, mineral extractives, cement
Manufacturing	Information technology, home electronics, construction and home-building products, batteries,
	textiles, apparel, footwear, and luxury goods, pharmaceuticals (for example antibiotics)
Services	Retail, hospitality and tourism, hospitals, and health-care services
Transport	Automobiles, fuel use and supply, engine emissions, road (tyres, surface)
Waste	Improper management of municipal solid waste (which includes e-waste, plastics, food waste, organic waste and open burning), industrial waste (which includes e-waste, construction and demolition waste), hazardous waste (which includes e-waste), sewerage effluents, landfills (leachates)

Mitigation Strategies

The proponent is committed to implementing measures that shall reduce emission of greenhouse gases and air pollution in general from the proposed development master plan activities. Such measures include:

- Use of renewable sources of energy such as wind, solar energy
- Retention of green spaces/landscaped spaces as carbon sinks
- Recycling of solid/liquid wastes
- Adoption of clean production mechanism.
- Adoption of green building technology.
- Adoption of efficient transport system.
- Train construction and delivery truck drivers on pre-cautionary measures that enable curb emissions for example advise on techniques to reduce dust evolution especially when driving in areas of dense human settlement or nearing the project site to avoid creating dusty conditions; techniques to conserve fuel and reduce emission by switching off the engines when vehicles are idling.
- Adopting air quality policy that binds developments such as industrial sector to pollution control and adherence to Air Quality Regulations 2014. The regulations provide for the prevention, control and abatement of air pollution to ensure clean and healthy ambient air.

The proponent will ensure a proper solid and liquid waste management system is available and functional to ensure its control. This will ensure nuisance from mismanaged solid and liquid waste such as bad odours and blocked drainages will be non-existent.

6.5.2 Increased Noise and Vibrations Impacts

The proposed master plan has highlighted various zones such as industrial use, public spaces, airports all of which are known to produce substantive noise and vibration levels. Development works will most likely result in noise generation because of the machines in use e.g. excavation equipment, mixers and construction vehicles delivering materials to active construction sites. The noise is expected to last for the entire Master Plan execution period, respective developments

operations and is likely to affect the neighbouring residents and institutions. Off-site noise will also be experienced near and along the access roads to the construction materials sources.

It is expected however that there will be a permanent increase in ambient noise levels with the completion and occupation of the developments. The ambient noise elevations will arise from the mundane activities in an urban developed area.

With proper planning of the various land uses to locate the noisier activities (such as industrial and commercial uses) near main roads or peripheral areas, and the residential / recreational / educational uses inwards in the more serene areas, noise impacts can be mitigated. Noise abatement plan will therefore be designed and implemented including redesigning some of the proposed zones.

Mitigation Strategies

Significance of noise impacts depends on whether the master plan would increase noise levels above the existing ambient levels by introducing new sources of noise. Noise impacts would be considered significant if the plan would result in the following:

- Exposure of persons to, or generation of, noise levels more than standards established in the local general plan or noise ordinance, or applicable standards of other agencies,
- Exposure of persons to, or generation of, excessive ground-borne vibration or ground-borne noise levels,
- A substantial permanent increase in ambient noise levels (more than five dBA) in the project vicinity above levels existing without the project,
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

The proponent should put in place several measures to mitigate noise pollution. The following noise-suppression techniques should be employed to minimize the impact of noise and vibrations;

- Plan to locate the noisier activities (such as industrial and commercial uses) near main roads or peripheral areas, and the residential / recreational / educational uses inwards in the more serene areas.
- Establishment of buffer zones between different land uses will attenuate noise, further reducing the potential impacts.
- Adherence to noise ordinances such as the Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations, 2009
- Employment of noise attenuation mechanisms for point sources. These include:
  - Install portable barriers to shield compressors and other small stationary equipment where necessary,
  - Consider use of quiet equipment (i.e. equipment designed with noise control elements),
  - Using noise control devices, such as temporary noise barriers and deflectors for impact and blasting activities, and exhaust muffling devices for combustion engines,
  - Avoiding or minimizing transportation through community areas,
  - Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible,
  - Construction/Demolition works should be done during the day when people are away and the outside environment is also noisy,

6.5.3 Increased Energy Demand

The different Vipingo master plan zones will house state of the art facilities whose demand for energy will be high. The mixed-use development will consume fossil fuels (mainly diesel) to run

transport vehicles and construction machinery. Construction activities will mostly require fossil fuel in the running of construction vehicles, and generators. Some grid energy will also be required during construction but will be more so required for lighting and powering of machinery/equipment in residential, commercial, and industrial establishments in the operation phase. Fossil fuel is non-renewable, and its excessive use may have serious environmental implications on its availability, price and sustainability. The developments construction phase will also use electrical equipment and/or machines. Electricity in Kenya is generated mainly through natural resources, namely, water and geothermal resources. In this regard, need to use electricity sparingly since high consumption of electricity negatively impacts on these natural resources and their sustainability.

Mitigation Strategies

The proponent is expected to put in place the following strategic measures to reduce energy consumption

- Carry out energy audits for evaluation and improvement of energy consumption and saving practices adopted by all sectors involved
- Capitalise on renewable energy opportunities which include the harnessing of solar energy, and generation of energy from waste. This will reduce over-reliance on fossil fuel and expensive sources of energy such as diesel.
- Practical energy management and conservation options also require to be implemented as highlighted in the Energy ESMP
- Observe green building technology,
- Ensure machines, equipment and transport systems are energy efficient,
- Put in place systems to monitor energy consumption and aid in future planning.
- Adhere to requirements of the various Energy laws and Regulations including Energy Act, 2019

6.5.4 Increased Water Demand

The proposed Vipingo Mixed Use Master Plan has earmarked mega developments. Notably all the land use zones - Residential zone, Office and Commercial Zone, Industrial Zone, Hospitality Zone, Institutional zone, Recreational and sport activities zones, Support trunk infrastructure, Undeveloped & Agriculture and Natural Green Space - are anticipated to result into increased water demand in their own entity. This will put pressure on the existing sources of water such as rivers, boreholes, wells amongst others. Excessive exploitation of water as a natural resource has a negative impact on the environment. To curb this, sustainable water resource protection, and conservation options require to be instituted. Surface and ground water quality from periodic tests and analysis will need to be conducted for various land use zones. The anticipated increase in water demand necessitates the need to conduct hydrological studies and account for the actual water demand for the development relative to proposed land uses. Further the studies will help to establish the potential of ground water resources in Vipingo area and amounts of storm water that can be harvested for utilization. The supply potential of Kilifi – Malindi water Sewerage Company and others need to be examined in respect to other development sectors in the areas such as tourism.

Mitigation Strategies

An array of strategies should be employed to reduce excessive consumption of water in the proposed master plan development activities. These include:

- Undertake hydrological studies and account for the actual water demand for the development relative to proposed land uses
- Adopt water systems that are efficient and not prone to wastage
- Adopt the proposed desalination plant to take advantage of the ocean waters
- Adopt systems to recycle wastewater

- Development of storm water management plan with design strategies for storm water treatment and filtration systems. Such would entail use of recycled and harvested storm water in cleaning and Landscaping
- Put in place systems of monitoring water consumption and aid in future planning
- Ensure sustainable water resource protection, and conservation options.
- Adopt and implement a water conservation and management & monitoring plan for the development including surface and ground water quality checks from periodic tests and analysis in the various land use zones.

6.5.5 Increased Solid & Liquid Waste Generation

The different zones of the proposed Vipingo master plan will generate large amounts of both liquid and solid waste. All the proposed developments and land uses will generate a substantial amount of solid and liquid waste. During development phase, spoil materials (soil, rocks, vegetation) packaging materials (e.g. paper, polythene, plastic, and metallic packaging), reject materials (including damaged bricks, concrete and mortar, plastics), wastewater, used oil among others will be generated. Adequate waste management measures are required since dumping/careless disposal both on-site and off-site will cause environmental pollution, interfere with aesthetics, and lead to creation of breeding grounds for vermin. The households, commercial and industrial developments are also likely to generate significant amounts of effluent and organic/inorganic wastes. These wastes require proper handling and disposal to avoid environmental pollution such as surface and ground water hydrology and water quality degradation / pollution.

These should entail an assessment of the existing and planned management infrastructure on site, and Kilifi County at large. Scenarios should investigate waste management capability for Kilifi County. The potential of alternative waste management technologies such as waste to energy, waste recycling, incorporating on circular economy aspects to the various land use sectors such as industrial zone should be explored.

Inadequate management of solid and sewerage waste from the developments will lead to pollution and creation of human health hazards endangering the residents and the public. Proper effluent management plans including treatment and discharge into the existing trunk sewer systems and recycling of wastewater will be required to mitigate the potential adverse impacts of the generated effluent.

Mitigation Strategies

- Adopt an Integrated Solid Waste Management System for the proposed development.
  - First, Prioritise the reduction of waste at source of the materials. This option will demand a solid waste management awareness programme in the management of the various zones as proposed under the master plan.
  - Secondly, Re-using, Recycling, and compositing of the waste will be the second alternative in priority. This will call for a source separation programme to be put in place. The recyclables will be sold to authorized waste buyers.
  - The third priority in the hierarchy of options is combustion of the waste that is not recyclable to produce energy.
  - Finally, sanitary landfilling will be the last option for the proponent to consider.
- Separation of waste per respective zones domestic, commercial, and industrial waste will be best suited to ensure effectiveness in waste management
- Explore the potential of alternative waste management technologies including circular economy aspects to the various land use sectors such as industrial zone.
- Other measures of solid waste reduction and management include:

- Consider the use of recycled or refurbished construction materials. Purchasing and using once used or recovered construction materials will lead to financial savings and reduction of the amount of construction debris disposed of as waste,
- Use of durable, long- lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time,
- Provision of facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements,
- Purchase of perishable construction materials such as paints incrementally to ensure reduced spoilage of unused materials,
- Use of building materials that have minimal packaging to avoid the generation of excessive packaging waste,
- Use of construction materials containing recycled content when possible and in accordance with accepted standards,
- Dispose waste more responsibly by dumping at designated dumping sites or landfills only,
- Waste collection bins to be provided at designated points on site,
- A licensed waste disposal company to be contracted to transport and dispose the solid waste.

- Establishment of a waste water treatment plant for the mixed use development.
- Pre – treatment of industrial effluent before discharge into sewers should be enforced as per regulations. Enactment of relevant laws such as Environmental Management and Coordination (Water Quality) Regulations, 2003 and Waste Management Regulations, 2006.

6.5.6 Changes Land, Soils and Geology

Execution of the proposed Master Plan will affect the soil and geology of the land in ways such as depletion of the local soil resource from excavation and carting away of spoil material, and soil degradation from compaction and soil sealing leading to increased surface runoff and soil erosion. Soil compaction happens during development activities or when remodelling of some type occurs. Other causes of compaction are hardscape or landscape modifications such as driveways, sidewalks, or patios. Any time that equipment, vehicles, or people are driving or operating under trees, there will likely be soil compaction, leading to unhealthy and possibly dead trees.

Spillage of hazardous construction chemicals (such as oils, fuel, grease, paints, solvents, curing compounds, adhesives, acids, soil stabilizers and binders etc.) may also lead to soil contamination while importation of soil in landscaping and fill activities may lead to introduction of invasive species / noxious weeds and pathogens such as bacteria, fungi and nematodes.

Increased soil erosion, storm water generation and sedimentation is likely to be expected, usually an indirect impact of vegetation clearance and increased built up areas. Removal of sisal bushes, indigenous and exotic tree species will leave bare land subject to soil erosion. Such bare land will be prone to wind and water erosion. Soil erosion is a serious problem both at its source and downstream of the area designed for Master Plan. Lost soil is deposited elsewhere, and the location of the deposition could alter downstream hydrology and increase flooding. It may also interfere with water quality directly through increasing turbidity levels, siltation and indirectly from contaminants carried with or attached to eroded soil particles. It is considered that these impacts can be mitigated and should be adequately addressed as per Environmental and social Management Plans (ESMPs) developed.

6.6 Positive Impacts on the Biological Environment

6.6.1 Conservation of riparian zone / riverine vegetation

It is expected that landscaping will be concurrent with the development works on various land use zones. During landscaping of the various zones, assorted urban forestry trees species some exotic and others indigenous will be introduced. The landscaped areas will increase tree cover at the sites proposed for green areas/parks in the master plan. Some sections of the proposed Mixed-Use Development will be set aside as open spaces and others for natural walks. It is likely

that most of these sections will be kept under natural vegetation. This will greatly increase tree cover at the proposed project site currently under sisal plantations.

6.6.2 Conservation of wildlife habitat and green spaces

The proposed Mixed use development Master Plan has set aside 9% of total acres in the development to be green spaces. This is exclusive of 2% water bodies. Phase 1 of the masterplan has specifically set aside 5% of the land to be green spaces which will also act as habitat for conservation of wildlife. Creation of buffer zones and protection of the green zone around marine catchment areas will go a long way in cushioning the areas from spill-over effects of the proposed mixed-use development. Notably, green spaces interventions are known to improve environmental conditions, protect and improve biodiversity, promote outdoor activities and active life- styles, increase social interaction and exchange, and provide healthy urban conditions for good physical and mental well-being. Apart from creation of habitat for wildlife and the green spaces will minimize air, water, and noise pollution, and may offset greenhouse gas emissions through CO^2 absorption. The green spaces also provide for storm water attenuation, thereby acting as a measure for flood mitigation including preservation of biodiversity and nature conservation.

6.7 Negative Impacts on the Biological Aspects

6.7.1 Loss of Vegetation Cover and habitat Fragmentation

Most of the isolated indigenous trees at the sisal plantations will not be cleared to pave way for the proposed Master plan activities. However, spill-over effects will occur as vegetation in the neighbourhood is trampled upon by workers and construction machinery. This is expected to have a negative impact on the site. Cutting down/clearing of vegetation is known to have adverse effects on the environment such as reduction of biodiversity, reduction of aesthetic beauty, exposure of soil to surface run-off, reduction of shade and increment in dust pollution among others. Exposure of ground due to vegetation clearance will result to surface run-off. In absence of vegetation, dust pollution is expected to occur as well as sedimentation of the neighbourhood water bodies such as the Indian Ocean.

Mitigation Strategies

To reduce the loss of vegetation cover and habitat fragmentation, the following should be established:

- Carry out landscaping of different zones,
- Maintain the proposed green spaces as per the master plan,
- The nature trails and research sites as per the master plan to be enriched with native vegetation,
- Unless it is mandatory, avoid clearance of the existing indigenous tree species.
- Carry out afforestation programmes especially at buffer zones of the different zones.

6.7.2 Habitat Alteration

The SEA study notes that the execution of the proposed Master Plan will lead to habitat alteration and eventual loss of sisal agricultural land. Although the alternative of analysis clearly showed that the mixed-use development will have higher benefits, its ideal that the Master Plan ensures reduced catchment disturbances. The marine vegetation plays critical environmental and ecological roles as such maximum caution during planning to avoid land use changes that might result into disturbances to the marine ecosystem.

Mitigation Strategies

The following mitigation strategies should be put in place to cushion habitat alteration from the proposed Vipingo Development:

- Maintain the proposed green spaces as per the Master Plan
- Where clearance of natural vegetation is inevitable; ensure replacement with indigenous species / tree planting program in landscaped sections and other green spaces
- Formulation and implementation of a marine ecosystem management plan in collaboration with KWS, KFS and other relevant agencies
- Formulation and implementation of a Biodiversity Management Plan
- Undertake ecological assessment including site specific invertebrate assessment during EIAs
- Ensure all projects comply with the Environmental Management and Co-ordination (Conservation of Biological Diversity and Resources, and Access to Genetic Resources and Benefits Sharing) Regulations, 2006.

6.7.3 Loss of Biodiversity, species and Communities

The sisal plantations host wildlife such as snakes and a wide range of rodents. Like plant communities, wildlife habitat may be impacted negatively both from direct and indirect activities associated with the development. Human-wildlife conflicts will thus be exacerbated while the movement of livestock and humans may also be impeded. Alteration, fragmentation, or destruction of wildlife habitat can result in the direct loss or displacement of species and the ability of the ecosystem to support other biological resources such as the plant communities upon which the wildlife relies on for survival. In the event that there are rare or endangered animal species they may be rendered locally extinct.

Mitigation Strategies

The following mitigation strategies should be put in place to cushion the local biodiversity from negative impacts of the proposed Vipingo Development:

- Unless it is mandatory, avoid clearance of native vegetation,
- Where clearance of native vegetation is inevitable, consider introducing such natives in landscaped and other green spaces to compensate for the loss,
- Consider leaving isolated patches of indigenous vegetation to act as refuge to small wild game during implementation of the master plan,
- Where feasible, allow for migration of the small wild game to the neighbourhood undisturbed sites during implementation of the master plan,
- Consider putting up a small orphanage/park and introduce native wild game.

6.7.4 Degradation of Marine Resources

The development site for Master Plan is characterized by Indian Ocean on the South Eastern side. Neighbouring residents use the ocean for fishing activities and recreation. Implementing the proposed Vipingo Mixed Use Development Master Plan may interfere with the natural drainage and marine systems and modify flow of surface water into the ocean. This is attributed to levelling and site clearance activities in the proposed site.

The spin-off/spill-over effects of the proposed Vipingo economic hub will probably affect the mangrove forest in the neighborhood. Key threats that have been facing the mangrove forest over the years include pollution through liquid wastes discharge to the ecosystem and forest disturbances especially by salt processing companies. The abundance of mangrove vegetation which are different from the drier uplands sets a different vegetation ecosystem form their surrounding consisting of hydrophytes. Mangrove ecosystems are productive and a valuable resource providing numerous social, economic, and environmental benefits. These ecosystems

are likely to be interfered with during implementation of various zones especially those to be located on the Eastern side of the proposed site.

During masterplan implementation, high turbidity level may be noticeable through excavations and rains when loose soil materials flow into the ocean. These impacts will be temporary during the construction stages. These changes can contribute to soil erosion, flooding, channel modification, downstream scouring, and sedimentation in the ocean. The storm water from development may affect marine ecosystem if directly drains into the water bodies. Typically, storm water/surface run-off from urban environments is known to be of low quality due to high level of sediment loads and pollutants. Entry of such waters into water bodies is likely to degrade the quality of marine ecosystems. Creation of buffer zones and protection of the riparian / green zone around marine catchment areas will go a long way in cushioning the areas from spill-over effects of the proposed mixed-use development.

The proposed developments envisioned in Vipingo Mixed Use Development Master Plan near the Indian Ocean can pose Marine pollution risks. This is from the wastes and effluents that may be generated which if not managed by a proper solid and liquid waste management system will find their ways into the marine environment. Many pollutants can affect large populations of smaller marine animals and plankton, which are then no longer available for larger animals to eat. This shortage soon begins to reduce the numbers of the larger animals. As the chain continues, the number of sea creatures in the ocean gets smaller, which reduces the amount of fish stock available for commercial markets.

Mitigation Strategies

The following mitigation strategies should be established to mitigate possible disturbance of the marine environment that will arise due to implementation of Vipingo Mixed Use Development Master Plan:

- Creating a buffer zone and flood ways can minimize interference to natural drainage systems flowing into the ocean.
- Recommended vegetation should be planted to protect the mangroves and the shoreline. The proponent should also work closely with the relevant departments to protect the marine life. Indigenous species should be preferred over exotic species. These are species tested by KEFRI and other organizations which have high survival rates and have multiple benefits. They include; *Casuarina cunninghamiana* (River oak), *Combretum molle (*Murema), *Cordia africana (*Muringa), *Croton macrostachys (*Mutundu), *Croton megalocarpus (*Mukinduri), *Cupressus lusitanica (*Cypress), *Eriobotrya japonica (Loquat Fruits), Pinusradiata (Pine)* among others.
- Adhering to the provisions of Wetlands, Riverbanks, Lake Shores and Sea Shore Management Regulation, 2009 among other laws and regulations.
- All proposed developments as envisioned by Vipingo Development Masterplan to be located eastwards should be connected to treatment plants that meet the Environmental Management and Co-Ordination (Water Quality) Regulations, 2006 among other laws and regulations.
- Undertake a detailed feasibility study for the development site before the implementation starts to minimize encroachment on the coastal and marine ecosystems in Vipingo area. This should be done by:
    - defining and protecting environmental values to protect and improve the condition of the marine environment.
    - Reducing and eliminating (where practical) the major environmental pressures that degrade, or threaten to degrade, the marine environment and its associated values.
    - Conserving the marine environment and associated values identified as most important.

- Managing and using marine resources in a sustainable manner and rehabilitating degraded marine areas where practical.

6.8 Positive Impacts on Socio-Economic Aspects

Table 6-3 gives a detailed analysis of the positive impacts on socio-economic aspects of the master plan execution.

Table 6-3 Positive Impacts on Socio-Economic Aspects

Socio-Economic aspects	Description
Growth of hospitality industry	The Vipingo master plan has a zone proposed for a 5-star and 3-star hotel and resort. Amusement parks have also been included in the master plan. The presence of these facilities will be a major boost to the tourism industry. Accommodating more tourists will translate to income to the proponent and revenue generation to the Kilifi County and the National government.
Creation of additional residential space	A residential zone measuring approximately 3250 acres has been set aside as per the master plan. The zone will house low, medium and high density of people mainly middle- and high-end-income earners. It is important to note that in Kenya, the housing space demand by far outstrips the unit supply. This has led to the scramble for the fewer available spaces, which are usually charged expensively. Implementation of the master plan will greatly bridge the existing housing shortage in Kilifi County.
Growth of industrial sector / Contribution to the Manufacturing Agenda	According to the Vipingo master plan, 2350 acres will be used for industrial activities. Both light and heavy industries will be established in this zone including Contribution to the manufacturing, processing and distribution warehouses. Growth in industrial sector will generally be accompanied by a wide range of benefits such as employment opportunities, government revenue amongst others. Establishment of more industries will significantly contribute towards achievement of vision 2030.
Increased office and commercial space	A zone measuring approximately 1750 acres has been earmarked for setting up office parks, show rooms, retail malls amongst other development of commercial facilities. Establishment of office parks will result to improved service delivery and efficiency in doing business. Taxes to be paid by the office occupants and other commercial facilities will contribute towards raising revenue to national and county governments.
Promotion of Learning and Research institutions	The Vipingo master plan proposes a zone of approximately 300 acres to be used in setting up institutions such as schools, churches and hospitals. Both private and public hospitals, clinics and dispensaries will be put up. Universities, secondary and primary schools have been proposed in the master plan. As such, implementation of the master plan will not only lead to expansion of educational, health and social facilities but also promote efficient and improved provision of these basic services.

Socio-Economic aspects	Description
	Growth in health and education sectors is a key pillar in achieving vision 2030 and the sustainable development goals.
Expansion of recreational facilities	The master plan proposes 700 acres for recreational facilities. Among recreational facilities include stadia, nature trails, play grounds amongst others. These recreational facilities will support the tourism / hospitality industry thereby increasing employment opportunities, generation of revenue amongst other tourism enhancement benefits
Infrastructural development	From the master plan, it is evident that the proposed mixed-use development will be supported by advanced infrastructure. Such infrastructure and service utilities include transport such as roads, non-motorized transport system, renewable energy, electricity lines, water sources / lines, telecommunication lines, waste treatment plants amongst others. A strong and advanced infrastructure and service utilities translate to ease in doing business and a vibrant economy.
Creation of employment opportunities	Several employment opportunities will be created during the implementation phase of the various phases / zones including office and residential buildings, roads, telecommunication infrastructure, water projects, industries among other public amenities. This will be a significant positive impact since unemployment rates are currently quite high in Kilifi County and the country at large.
Revenue to national and county governments	Through payment of relevant taxes, rates and fees to the government and the local authority, the master plan implementation will contribute towards the national and county revenue earnings.
Increased business opportunities	The large number of master plan implementation staff required will provide ready market for various goods and services, leading to several business opportunities for small-scale traders such as food vendors around the construction site. The various zones to be implemented will also see an increase in demand for construction materials. This as a result will lead to increased business opportunities. During the operation phase of the proposed master plan, quite a number of businesses will mushroom hence creating additional employment and business opportunities for the population within and outside Kilifi County.
Improved security	Execution of the masterplan will lead to implementation of advanced security system for the development. Amongst key envisioned facilities include use of CCTV, gated community estates, private security services and establishment of a police

Socio-Economic aspects	Description
	station, emergency response system amongst other advanced security features.

6.9 Negative Impacts on Socio-Economic Aspects

6.9.1 Loss of Agricultural Land in Kilifi County

REA Vipingo sisal plantations contribute significantly to agricultural productivity in Kilifi County. Sisal is among the key cash crops in the County. The plantations support many livelihoods within the County and beyond. Land conversion from agriculture to the mixed-use development will mean a reverse of the gains so far made in the agricultural sector. Implementation of the master plan will, therefore, leave a major footprint in the agricultural sector in Kilifi County.

Mitigation Strategies

The following strategies should be established to reduce the loss of agricultural land:

- Retain some sections of the land under sisal plantations
- Carry out the development in phases
- Rent out undeveloped sections of the land to REA Vipingo for sisal production
- Invest some of the land in other agricultural investments

6.9.2 Loss of Sources of Livelihoods

The existing sisal plantations employs at least 1200 workers directly and many indirectly. Implementation of the proposed Vipingo master plan will thus mean loss of employment by the REA Vipingo workers. This will have direct negative impacts on the affected workers and indirect impacts on their dependants. However adequate measures should be established to ensure alternative sources of livelihoods to the affected workers.

Mitigation Strategies

The following strategies should be established to cushion REA Vipingo workers and their dependants from the negative impacts of land conversion:

- Provision of alternative employment opportunities in the proposed development during execution of the masterplan
- Carry out the development in phases and allow the undeveloped sections to be under sisal plantations
- Sensitize the REA Vipingo workers about the proposed mixed-use development and allow for smooth transition through livelihood restoration programs
- Where feasible compensate the affected appropriately and consider incorporating the locals into the labour force.
- Establish skills development and training opportunities to transit non-skilled local labour force skilled labour force.

6.9.3 Health and Safety Risk

The several developments and land use changes envisioned by the Master Plan will result to known workplace safety risks. Safety hazards are likely to increase resulting in a possible increase in accidents involving workers and/or the public. Development works will expose workers to occupational health and safety risks and injuries resulting from accidental falls or use of hand tools and construction equipment. Safety hazards are also posed to the public especially pedestrians and motorists passing near on-going developments.

Upon development (or various phases/projects are complete) and in operation, potential health and safety hazards may arise in the event of a lack of adequate facilities, protection measures,

worker protection measures, and general laxity in adherence to best practices and OSHA, 2007 regulations. Adequate health and safety plans will therefore require to be implemented to mitigate all foreseeable health and safety risks in the development.

Due to population influx, there is concern for increased spread of communicable and infectious diseases such as the COVID-19 pandemic and emergence of new diseases such as HIV/AIDS with a possibility of prostitution. Such social vices including drug abuse, immorality, teenage pregnancy and crime could catalyse health and safety risks.

Vipingo development Limited should implement risk management strategies to protect the community from physical, chemical, or other hazards associated with sites under construction during various phases. Risks may arise from inadvertent or intentional trespassing, including potential contact with hazardous materials, contaminated soils and other environmental media, buildings that are vacant or under construction, or excavations and structures which may pose falling and entrapment hazards. Risk management strategies may include:

Mitigation Strategies

- Establish an emergency plan to assist in managing occupational hazards and risks for the development. Risk management plans should also be established with other facility control and safety systems.
- Provide for the safety, health and welfare of workers and all persons at workplaces
- All places intended to be used as a workplace must be registered by DOSHS before they are occupied.
- Ensure that all building plans are approved by the Local Authority
- Establish monitoring measures, hazard identification and risk assessments and Safe Work Method Statements (SWMS) for all activities intended to be done at the development.

6.9.4 Traffic Related issues

The envisioned Vipingo Mixed Use Development is likely to result into an increase on current levels of human and vehicular traffic with major impact being felt in the immediate Mombasa-Malindi highway. Human population increase will result to a directly proportional increase in number of vehicles. This may pose a risk of increased traffic related accidents/incidents and traffic snarl-ups. Such impacts will be exacerbated by the ongoing urbanization of Kilifi, Malindi and Mtwapa Towns. It is therefore important to ensure a traffic impact analysis is conducted based on KeNHA and KURA plans. Key insights should be on how traffic in the Master Plan area will be managed including design standards for connections to the existing national roads. Further, capacity of existing traffic and transport infrastructure to support the traffic is required. Clear improvement/modifications need to be recommended including the type and capacity of the access junction to be established, the peak hourly traffic volume along the existing roads as well as from the development needs to be established. Further trip distribution and route assignment of the development traffic needs to be established. The data requires to be forecasted into the future planning horizon of each land use area / phase to establish the future capacity of the roads.

Traffic Impact Analysis (TIA) should help to determine the possible effects of the development on the transportation and traffic system. TIA should be used as one of the vital parts of several kinds of information's to judge the suitability of development from a transportation standpoint. Traffic congestion results in several problems, including economic cost due to delayed travel times, stop and go situation of traffic at both link and nodes in any traffic network and its concomitant air pollution and of course road accidents. As one roadway becomes congested, drivers may use other roads not necessarily intended for through traffic. Often TIA it is applied only to the direct impact area and countermeasures for potential negative impacts are specific for the development. TIA will help to assess the adequacy of the existing or future transportation infrastructure to

accommodate additional trips generated by the proposed mixed-use development and land use rezoning.

Mitigation Strategies

- Establish and implement a Traffic Management Plan. Key aspects to be considered include:
  - Warning signs, aimed at both drivers and other road users, to highlight hazards will be erected along the Mombasa-Malindi highway,
  - Demarcated pedestrian crossings will be established at appropriate points where necessary,
  - Barriers to separate vulnerable road users (pedestrians and cyclists) from vehicle traffic in high-risk areas will be considered in the proposed plan area.
  - Road safety initiatives proportional to the scope and nature of project activities should be designed:
- Adoption of best transport safety practices across all aspects of proposed plan operations with the goal of preventing traffic accidents and minimizing injuries suffered by project personnel and the public.
- Ensure a good connection between spine roads and the Mombasa- Malindi highway.
- Provision of adequate vehicular circulation space and parking areas
- Provision of pedestrian walkways along all roads within the development
- Paving all pedestrian walkways with robust, durable, and non-slippery materials
- Provision of all necessary street furniture along all roads within the development to accommodate users (including the disabled, elderly, and children) and to enhance security.
- Provision of bollards in appropriate areas to prevent vehicles from encroaching into the pedestrian domains.
- Provision of streetlights to provide sufficient light for both pedestrian areas and carriage ways.
- Provision of trees along pedestrian walkways for shading and that require minimum maintenance, preferably indigenous for ecological and cultural advantages.
- Ensure Installation and maintenance of all construction signs, signals, markings, and other devices used to regulate traffic, including posted speed limits, warnings of sharp turns, or other special road conditions

6.9.5 Mushrooming of Informal Settlements

The proposed development may involve mushrooming of informal settlements and kiosks around the surrounding area owing to workers' preference to stay near their places of work to reduce on costs associated with transport.

Mitigation Strategies

- Liaison with Kilifi County's planning department on effective planning regulations and enforcement
- Vipingo Development Limited should work in collaborative partnerships with the planning department of Kilifi County in supporting the developments compatibility with the neighbourhood scale and character.
- Low-density residential subdivisions and development should be discouraged from developing immediately adjacent to arterial roadways which are anticipated for long-range widening and improvements unless appropriate transitional zoning or buffering is provided.

6.9.6 Risks on Human health and sanitation

Execution of the masterplan may lead to increased risks on human health and sanitation. A major global problem of urbanised development is the risk of air pollution whereby harmful substances are suspended in the air. This could include particulate matter, most commonly attributed to industrial plants and refineries waste, or chemicals like CO2 or Methane (which are also products of plants and refineries as well as cars and other modes of transportation). Due to a vast number of people expected in Vipingo Mix -use development, the air pollution can be major risk if not well managed. It can lead to human health problems such as: Asthma, cardiovascular problems or disease, and different types of cancer (most commonly lung cancer) and being more susceptible to respiratory diseases, and a shortened life span.

The full execution of the masterplan will result to urbanization and reduce viable agricultural zones which may affects the populations health through people's change in diet. For instance, accessibility to quality foods may be limited leading to increase in consumption of low-quality, and quick food that can lead to diabetes, hypertension, heart disease, obesity, or other health conditions. Because of urbanization, there is a likely of high-density communities living in small gated areas, where people will have less access to areas in which to exercise. Notably jobs in proposed industrial and commercial areas may also contribute to the lack of exercise. Most jobs in such tend to require the workers to work indoors with reduced movement. Due to fast-paced life, the residents of the development may end up with sedentary duties. Many of the jobs require odd hours of work and promote a stressful environment and unhealthy food habits.

It worth noting that urbanization which is likely to result from the development may lead to risks of poor sanitation which can result to waterborne and vector-borne diseases. Such diseases include dengue and diarrhoeal diseases linked to unsafe water storage and poor waste management, especially seen among urban poor settlements. Urbanisation expected from the mixed-use development also brings about profound changes in social organisation and in the pattern of family life. A key outcome is reduced social support so readily available in villages. The rise of nuclear families especially makes urbanites vulnerable to psychological trauma and to mental disorders. These include dementia, depression, substance abuse, alcoholism and family disintegration. World Health Organisation (WHO) in a report titled 'The Mental Health Context', noted that mental disorders account for nearly 12% of the global burden of disease. The incident of mental disorders is highest in young adults, the most productive age of the population.

Mitigation strategies

- Ensure protection and development of 10% of land use for green spaces in which people can have physical exercise/ activities and to ensure air quality enhancement
- Ensure phased development and establish policies to retain agricultural zones for production of healthier food and good nutrition to the residents
- Build trust, social capital and social cohesion such as residents association, age-cohort programs, and network that can represent all stakeholders through community participation.
- Establish recreational facilities targeting various age-cohorts (children, teenagers, young adults, adults, and the elderly) to enhance sharing knowledge, skills and social intervening
- Establish strategies for sustainable living environment based on access to clean and sufficient drinking-water, appropriate sanitation and sewage systems, solid waste management and safe & healthy housing and neighbourhoods.

- Ensure full implementation of national legislations & international guidelines on occupational health and safety, labour relations including employment to ensure safe and healthy workplaces
- Designate zone for advanced and affordable primary health care facilities to manage current and emerging communicable and infectious diseases
- Prevent possible urban crime, violence and substance abuse by establishing partnerships with relevant agencies at county and national government.
- Implement masterplan physical planning / development control to control rapid urbanization/ emergence of informal/ uncontrolled settlements

6.9.7 Rise to Grievances

The SEA study for proposed Vipingo Mixed Use Development established existence of households within the area designed for Master Plan area. Due to the anticipated development scale, and displacement of people, rise to grievances among the affected population over varying issues ranging from rates of compensation and eligibility criteria to the location of resettlement sites and the quality of services at those sites to unknown fears will inevitably lead to grievances. Timely redress of such grievances is vital to the satisfactory implementation of resettlement and to completion of the development.

Mitigation strategies

- Vipingo Development Limited should develop and ensure that grievance redress procedures are in place to allow affected people to lodge a complaint or a claim (including claims that derive from customary usage) without cost and with the assurance of a timely and satisfactory resolution of that complaint or claim.
- Establish special accommodations for women and members of vulnerable groups to ensure that they have equal access to grievance redress procedures. Such accommodation may include;
    - Employment of women or members of vulnerable groups to facilitate the grievance redress process or,
    - Ensure those groups representing the interests of women and other vulnerable groups take part in the process.
- Grievances to be redressed through project management, local civil administration, or other channels of mediation acceptable to all parties. Such channels of mediation may involve community and traditional institutions of dispute resolution.
- Vipingo Development Limited management should make every effort to resolve grievances at the community level. Recourse to the legal system should be avoided except as a last resort.
- Key measures for grievances redress from affected people or organizations/ institutions should include;
    - Institutional arrangements for grievance redress;
    - The procedures for recording and processing grievances;
    - The mechanisms for adjudicating grievances and appealing judgments; and
    - A schedule with deadlines for all steps in the grievance redresses process.

6.9.8 Public Concerns

Based on the proposed Master Plan and scale of the development upon execution, it will have varying impact to the local communities and public who derive their livelihoods from the sisal plantations. The Vipingo workers earning a livelihood will lose their jobs once the sisal plantation

is cleared for development. This will have a localized impact on the public and neighbouring rural household economy. The SEA household socio-economic survey established households in the following villages living in the Vipingo Sisal plantations Vipingo Main Estate, Vipingo trading centre, Shauri Moyo, Bureni and Kambi ya Funza.

Mitigation strategies

In brief the following mitigation strategies are recommended:

- Maximize the recruitment of locals where possible and have a Labour Management Plan to ensure workers' labour rights including health and safety and are protected with fair remuneration.
- Develop community awareness programmes to enhance cohesion between project employees and the local community
- Consult with the public and the locals during implementation of proposed developments
- Sensitize sisal workers about the proposed mixed-use development and allow for smooth transition
- Develop and implement a Livelihood Restoration Plan (LRP) for the sisal plantation workers whose career will be affected during execution of the proposed Vipingo Mixed Use Development Master Plan.
- Develop and implement a grievance redress mechanism (GRM) to address concerns of the locals.
- Develop a livelihood restoration plan for implementation throughout the master plan execution phases
- Establish a corporate social responsibility (CSR) plan to support key community needs / facilities such as provision of water access to the community at a subsided rate including improvement programs to surrounding school's (such as Rea Vipingo and Shauri Moyo)
- Develop a policy for local partnerships with NGOs, national and county government agencies such as Kilifi – Mariakani Water and Sewerage Company (KIMAWASCO) on water supply and learning institution such as Kenya Medical Training College (KMTC)
- Ensure public facilities including roads, parks within Vipingo development are aligned with the master plan and protected for accessibility / use by the public

7 ALTERNATIVE OPTIONS OF THE MASTER PLAN

7.1 Introduction

An alternative analysis of various Master Plan options has been discussed in this chapter. The analysis bases this on various options including the employing alternatives to achieve the same plan, use of alternative approaches, and the no intervention and discussing the implication of key Master Plans to the proposed Vipingo Mixed Use Development Master Plan. The chapter begins by identification of alternatives which include the no intervention option (carbon sink), farmland/agriculture, Mixed Land Use Alternative and proposed mixed use development. Justification of the preferred alternative is given in succeeding section with the linkages with ongoing projects and developments forming the last subsection in the chapter.

7.2 Alternative Options and Strategies

The land use zoning for the proposed Vipingo Mixed Use Development Master Plan was done after considering several suitability factors to meet the social, economic, environmental, cultural and even political aspirations of the respective planning jurisdictions. As a result, different land uses were opted for ranging from, among others, residential, commercial, industrial, green areas/open spaces, transportation, public amenities and infrastructure in a balanced manner that promotes sustainable development. The establishment of the proposed Master Plan conforms to this provision by actualizing the development demands in addition to meeting the flagship project proposals of the Kenya Vision 2030.

Much as this development conforms to the zoning provisions of the land, there is need to widen the scope of potential alternative developments that may suffice needs other than the designated use. Should there be justifications beyond reasonable doubt that an alternative development can be established on the land whose returns economically, environmentally and socially supersede those of a mixed-use development, and then a change of mind can be considered.

The SEA team identified four possible alternatives/ options to which the land can be used. They include: Option 1-No Development, Option 2- Mixed Land Use Alternative, Option 3-Farm land / Agricultural Use Option and Option 4-The Proposed Mixed-Use Masterplan Use. The likely environmental and socio-economic impacts of each option were assessed. The results are as reported descriptively below:

7.2.1 Option 1 -No Development (Carbon sink/ sequestration Option),

The proposed Vipingo Mixed Use Development shall occupy 9,574.49-acres of land. Land is one of the finite natural resource on earth. Its optimal utilization is therefore one key factor to consider. This option has the highest and most appealing environmentally and ecologically rewarding outputs and promote carbon sequestration. However, if the value of the land is compared to the no use option, this shall amount to massive wastage of valuable land, because it is located only 30 km from Mombasa town.

In this option, carbon sequestration would wholly depend on the current agricultural sector to remove carbon dioxide from the atmosphere. Trees are natural sequesters of carbon and depending on their characteristics and local circumstances, forests can play different roles in the carbon cycle, from net emitters to net sinks of carbon. Forests sequester carbon by capturing carbon dioxide from the atmosphere and transforming it into biomass through photosynthesis. Sequestered carbon is then accumulated in the form of biomass, deadwood, litter and in forest soils. Release of carbon from forest ecosystems results from natural processes (respiration and oxidation) as well as deliberate or unintended results of human activities (i.e., harvesting, fires, deforestation). For this process of carbon sequestration to succeed it is essential that carbon must

not return to the atmosphere from burning. Forests and stable grasslands are referred to as carbon sinks because they can store large amounts of carbon in their vegetation and root systems for long periods of time. Soils are the largest terrestrial sink for carbon on the planet. The ability of agriculture lands to store or sequester carbon depends on several factors, including climate, soil type, type of crop or vegetation cover and management practices.

Carbon sequestration is not separable from other environmental effects of a given land-use practice and the storage of carbon in agricultural soils is likely to come with a number of co-benefits including wildlife habitat, water quality, and landscape aesthetics Carbon Sequestration can assist significantly in maintaining the natural carbon cycle. However, to implement this practice properly there would be need to go for natural sequestration thus conversion of existing agricultural sector and more reforestation.

In this option, the site will remain in its current state as a sisal plantation. This means that the proposed mixed-use development would not take place. This option will have some advantages since no land use change will occur, the agricultural sector especially sisal farming in Kilifi County will not be affected and sisal estate workers will not lose their source of livelihood, among others. Though this is the cheapest option, there would be various losses and foregone opportunities as presented below: -

i. There will be financial losses to the master plan proponent since the proponent has invested a lot of capital in terms of acquisition, planning, professional and statutory fees.
ii. The Kilifi County and national governments will miss out the benefits of the proposed mixed-use development thus limiting its plans to become an investment and business destination. This translates to loss of revenue to the county authority.
iii. There would be loss of opportunity to provide local community with opportunities for income-generation and poverty alleviation.
iv. There would be loss of an opportunity to create jobs for increasing number of school leavers and graduates. The sisal estate currently employs around 1200 workers but the proposed mixed-use development will create more job opportunities directly and indirectly.
v. The statutory bodies and other professional firms engaged in the proposed development would miss out on the potential revenue.

7.2.2 Option 2 -Wildlife Conservancy

Wildlife plays an important role in balancing the environment and provides stability to different natural processes of nature and maintenance of essential ecological processes and life-support. Major threats to wildlife include habitat destruction/degradation/fragmentation, overexploitation, hunting, pollution and climate change. Wildlife conservation has social, environmental and economic benefits: Social in the sense that, apart from being a carbon sink by absorbing toxic gases in the environment, wildlife provides sites for natural beauty, hiking, controlled hunting, canoeing and wildlife photographing. On the environment perspective, wildlife plays an essential role in the ecological and biological processes that are yet again significant to life. The normal functioning of the biosphere depends on endless interactions amongst animals, plants and microorganisms. This in turn maintains and enhances human life further. To add on these, ecological processes are vital for agriculture, forestry, fisheries and other endeavors that support human life. Besides, there are several biological processes wherein wildlife plays a key role such as pollination, germination, seed dispersal, soil generation, nutrient cycling, predation, habitat maintenance, waste, breakdown among other benefits. Wildlife conservation is also linked to the acceleration of ecotourism on a national level which would be very influential stimulus for the Kilifi County and Kenyan economy at large. Eco-tourism and wildlife conservation are complementary or overlapping sectors of the economy. Income generated from ecotourism can be used to fund both wildlife conservation and socio-economic development to benefits of the local communities.

Wildlife species need four essential elements to survive: food, water, shelter, and space. Shelter must be adequate to protect the wildlife from predators and the environment. Space must be adequate for the wildlife to successfully rear their young. In addition to these four requirements, the spatial arrangement of these necessities must be in proper order. That is to say, the sources must be within a certain distance of each other so that the wildlife can access each safely on a daily basis. To control urban wildlife populations, one must manipulate one of the four habitat factors as wildlife cannot survive unless their habitat needs are met. If one of these habitat requirements is absent, wildlife will either migrate to another area capable of providing their needs or die. For long-term wildlife management, this can be challenging leading to possible human- wildlife conflicts in the proposed Vipingo development area.

As a result of ongoing developmental activities in both at Vipingo Development and neighboring Vipingo Ridge including agricultural activities at the adjacent Rea Vipingo most of the wildlife habitats are small and isolated. Ecologically, only small game can survive in such small habitats since the available resources for feeding, sheltering and reproduction are limited. This implies that the existing wildlife habitat will be decimated further to the detriment of the wildlife in habitation. Wild game is known to prefer natural ecosystems and any disruption that may result to departure from the natural state such as habitat fragmentation, loss of nesting sites and other wildlife habitat through bush clearing, disruption of watercourses, establishment of non-native invasive plant species, creation of barriers to wildlife movement and visual and auditory disturbance forces wild game to move out of their habitat, die of heat stroke or die due to lack of their most preferred diet. The proposed Master Plan mixed-use land uses are expected to subject the existing wildlife habitats to further disturbances/modifications. Incidences of habitat pollution, especially the water bodies and marshy lands, are likely to occur thus altering the existing natural conditions. Surface run-off from the proposed Master Plan development will be used to recharge the earth dams. Surface run-off from urban environs could be contaminated and this may compromise the quality of water to the detriment of aquatic life in habitation. Wildlife Conservancy option is therefore not compatible to Vipingo Development immediate surroundings of mixed land use developments and as much as this land use option is important, the economic gain is low as compared to the current option of utilizing it as mixed-use development.

7.2.3 Option 3 -Farm land / Agricultural Use Option

Agriculture is the predominant economic activity in the proposed development area. The development area is vastly under sisal plantations, baobab trees, bushland and grassland vegetation. Also notable are sparsely populated natural/indigenous tree species.

However, if this land use option is compared to other land use development option identified above, it will be noted that this is not the most optimal way to use the land. This land is in a prime land value area for the mixed use and mixed income area of Kilifi County.

7.2.4 Option 4 -Proposed Mixed-Use Masterplan Development

This option will focus on developing the whole 10,254 Acres of land for mixed use purposes, including residential (housing), commercial, industrial, educational, agriculture, recreational, public purpose and natural green spaces. All the proposed development will be served with a comprehensive transportation network (roads, cycle/walkways) and telecommunication facilities.

Recently, the Kenyan government, under its Economic Transformation Agenda, identified four key priority sectors for the development of the country and realization of Vision 2030. Popularly known as the Big Four, the transformation focuses on increasing capacity in affordable housing, manufacturing sector, universal healthcare, and food security. With housing provision for over 219,000 residents planned on completion, alongside tens of thousands of jobs in construction,

industrial and ancillary services, Vipingo Mixed Use Development will contribute significantly toward Kenya's Big Four Agenda.

Housing has always been a basic human need. Developing countries, Kenya included, have encountered the perennial challenge of housing shortage, more so for the low and middle-income population. The housing shortage can be attributed to the high urban population influx and growth rate. Kilifi County has also contributed to the scarcity of the high-middle-low income housing.

The mixed-use development option will optimize economic benefits in its entire decision-making. Commercial development shall promote the economic development by providing more space for doing business. One key factor to consider is the socio-economic impact of this option to both the locals and investors.

Industrial development on the other hand has a higher potential of impact on the value chain aspects of development. For instance, whereas the option will promote the various professional, business and service provision elements of development, industrial development shall promote the entire range entailing an Industrial park; Heavy industry and Light industry – light processing goods i.e furniture, packaging, soaps, plastics, pharmaceuticals, Warehousing – storage and logistics facilities. This shall also promote production for export. This will earn foreign exchange in the short, medium and long term. The housing development alone cannot achieve this.

Industrialization has been one of the major economic drivers since the industrial revolution era. As a result, less industrialized countries in the third world countries, Kenya included, have struggled to thrive economically and competitively in the global trade. It is on this backdrop that Kenya established several industrial development flagship projects in the Kenya Vision 2030. Industrial development is an approach to revitalizing the industrial sector that has been dwindling over time. In addition, industries focus on the public value rather than individual value.

The proposed master plan will accommodate more areas under conservation. Such areas will be maintained under natural vegetation through natural regeneration or can be enriched with selected native and exotic plant species. These areas together with the agricultural zone will serve as green areas of the proposed master plan. From the environmental perspective, this option is environmentally sound, friendly, and sustainable.

7.3 Justification of the Preferred Alternative - Proposed Mixed-Use Masterplan Use

Given the results of the analysis above, this master plan has opted for the Proposed Mixed-Use Masterplan Use (Option 4). This will result to optimal use of the proposed plan area to reap maximum sustainable benefits. Considering that the preferred option is going to have sustainability features, such as incorporation of renewable energy and eco-designs, this will go a long way in ensuring wise use of resources and boost conservation efforts in the region. Agriculture will continue to be practiced in the agricultural zones thus not eliminating this practice in the area. The open spaces/green areas/parks will provide a refuge habitat to the existing fauna. This zone will support the preserved indigenous trees in other zones together with those planted during the proposed afforestation programmes to act as carbon sinks in the area.

The proposed Vipingo Mixed Use Master Plan is thus expected to integrate all the facets of a sustainable development by ensuring that the economic, social and environmental factors are the guiding principles in the design, construction and management of the mixed-use development.

7.4 Linkages with ongoing Projects and developments

7.4.1 Roads infrastructure

According to the Draft Kilifi County Spatial Plan 2015-2025, the County relies on 4 major modes of transport, namely: Waterways, Roadways, Railways and Airways and Numerous Class E earthen minor roads of 648 Kms

- Kilifi County has a total classified road network of 101,000 km (out of which 1 is Class A Bitumen Trunk Road of 34.4Kms, 1 is Class B Bitumen National Road of 168.6 Kms, 5 are Class C Bitumen Primary Roads of 219.3 Kms, Numerous Class D Gravel Secondary Roads of 414Kms and Numerous Class E earthen minor roads of 648 Kms
- The Mombasa – Nairobi railway line passes through the County with stations in Mazeras and Mariakani. There is one station in Mariakani whereas the other railway terminus is in the neighbouring Mombasa County approximately 180km from Malindi town.
- The major waterway in the County is the Indian Ocean.
- Kilifi County has one second-class airport at Malindi and several airstrips at Mnarani Club, Kiswani farm, Vipingo ridge and Galana Game Ranch

The ongoing improvement of the roads in the county links with the projects and development envisioned by the proposed Vipingo Master Plan. Notably, developing transport and infrastructural services is pivotal to support industrialization and sustainable development. There are ongoing road projects such as:

- 10km Malindi-Sala Gate road in Kilifi County
- The construction of the 35km Kaloleni-Mavueni road
- The 117km Malindi-Sala Gate Road
- 45km Mariakani-Bamba road

In specific, the 117km Malindi-Sala Gate Road is key to tourism as it links Malindi resort town to Tsavo East National Park in Taita Taveta County. Notably, most of the tourists who visit Malindi for holiday use the road to tour Tsavo for game drives as it is a shorter route compared to the Malindi-Mombasa highway. In general, the road projects will ease transportation of goods and passengers in the region and are also expected to boost tourism and agriculture between Kilifi, Mombasa and Taita Taveta counties. The roads will also assist to connect production areas to potential markets; enhance accessibility; open County hinterland and increase and expand existing infrastructural services. This links and is applicable to all the sectors envisioned in the Vipingo Master Plan.

7.4.2 Coastal Economic Bloc -The Proposed Jumuiya Ya Kaunti za Pwani

The County is a member of the proposed Jumuiya Ya Kaunti za Pwani, a non-political social-economic union being formed to spearhead development in Coast region. The inter-county projects that the county government will implement in partnership with other counties and relevant stakeholders interlink with Proposed Vipingo Mixed Use Development Master Plan. Some of the linkages are illustrated below:

Table 7-1 Jumuiya Ya Kaunti za Pwani projects linkages

Sector	Project Name	Objective	Counties involved
Environmental Conservation, Water & Natural Resources	Solid Waste Management Programme	To increase effectiveness and efficiency of county waste management systems	Kilifi and Mombasa

Agriculture, Rural and Urban Development	Mariakani Milk Scheme	To increase regional productivity and income from milk and milk products	Kilifi, Kwale, Mombasa and Taita Taveta

7.4.3 Developments in Kilifi Tourism Sector

According to the Draft Kilifi County Spatial Plan 2015-2025 the County is home to 2 National Marine Parks and Reserves namely Malindi Marine Park and Watamu Marine Park. Kilifi County also has a rich cultural heritage that should be protected from erosion (due to influence of foreign cultures) and should be explored and exploited as resource which underpins the development of Vipingo Mixed Use Development Master Plan. Some of the attractions in the tourism sector that links with Vipingo Mixed Use Development include: 5, 4, 3 and 2 star tourists accommodations which include Medina Palms, Eden Rock, Billionaire's Resort, Mwembe Resort, Dream of Africa, Angels Bay, Tropical Village, Kilili Bahari and Coral Key , Hemingways, Ndovu Resort, Turtle Bay, Aquarius, Blue Bay, Garoda and Jacaranda Beach Hotel, Ocean Beach hotel , Kilifi Bay, Baobab Lodge and Mnarani Club, Sun and Sand Beach Hotel, Royal Reserve, North-Coast Beach hotel in Kikambala. Non star-rated accommodation facilities are in the County's major towns of Mariakani, Mtwapa, Kilifi and Malindi

Heritage sites include the Mnarani Ruins, Jumba la Mtwana, Gede Ruins, Mambrui town, Vasco Da Gama Pillar, Pillar Tombs. The Malindi Old Town, Hell's Kitchen, The Malindi Museum, and the Portuguese Chapel. It is envisioned that the proposed Vipingo Mixed Use development recreational sector and hospitality zone links with the ongoing growth of tourism sector in Kilifi County. Upon its execution the master plan will be part of branding and marketing of Kilifi County as a preferred tourist destination. The various sectors envisioned by the Master Plan such as commercial will play a role in creating an enabling environment for tourism and hospitality sector.

7.4.4 Developments in Energy, Infrastructure, and ICT sector

In the ICT Subsector, Kilifi County has built a County government connectivity infrastructure connecting all 7 Sub County headquarter offices to the Kilifi County WAN (Wide Area Network), deployed a unified communication system in the County HQ Offices and an Electronic Data Management System in the County to manage workflows and reduce paper usage. 14 Public Youth Polytechnics have been equipped with ICT equipment (Distoni YP, Gede YP, Adu YP, Mambayandu YP, Jilore YP. Kakoneni YP, Pingilikani YP), as part of ICT capacity building in the County especially among the youth.

Significant milestones have been achieved in the Energy sub-sector. Key among these are the installation of high masts lights along strategic roads, streets and in trading centers with a view of improving security and economic activities. These initiates links with the sectors envisioned by the proposed Vipingo Mixed use development. Notably the ongoing developments including approximately 76KM 220kV Malindi-Kilifi double circuit line and new 220/132kV substation at Kilifi by the Kenya Electricity Transmission Company Limited (KETRACO) and Kenya Power are envisioned to enhance energy distribution for the County including Vipingo Development.

7.4.5 Developments through the Lamu Port South Sudan Ethiopia Transport (LAPSSET) Corridor

Notably, the LAPSSET Corridor Program - a regional project between the countries of Ethiopia, Kenya and South Sudan - is part of the Kenya Vision 2030 Strategy which is the national long-term development policy that aims to transform Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030 in a clean and secure

environment. The proposed Vipingo Development Limited lies at a major trunk road (Mombasa-Lamu road) which will eventually link up with the LAPSSET corridor in Lamu. The planned upgrade of the Mombasa-Malindi -Lamu road to a superhighway will not only ease transportation but also enhance economic development within Malindi, Kilifi, Vipingo and surrounding areas. In addition, Vipingo Development is approximately 300 kilometers from Lamu. LAPSSET is also in close proximity to both Malindi and Kilifi, which are the biggest towns nearest to Lamu, hence definite social, and economic benefits are expected to be reaped by both Vipingo Development Limited and LAPSSET. The proposed interregional road network, including SGR and international airports provides ease of access from Vipingo Development to Ethiopia and South Sudan. Major transport boost is also expected for Vipingo Development Limited based on the East African Railways Master Plan (2009) envisioning an SGR line connection between Mombasa to Lamu Port.

8 CLIMATE CHANGE VULNERABILITY ASSESSMENT, ADAPTATION AND MITIGATION ACTIONS

8.1 Introduction

Cities are major contributors to climate change: although they cover less than two per cent (2%) of the earth's surface, cities consume 78% of the world's energy and produce more than 60% of all carbon dioxide and significant amounts of other greenhouse gas emissions, mainly through energy generation, vehicles, industry, and biomass use (UN habitat). At the same time, cities and towns are heavily vulnerable to climate change. Despite these risks, many cities have not yet addressed climate change. The reasons include a lack of relevant city policies and action plans; existence of regulations on urban planning and environment which have not been adjusted to manage climate change; slow response to climate disasters due to lack of capacity and resources; and lack of public awareness on climate variability and climate change-induced hazard mitigation. However, when meticulously planned, capacitated, and managed through the appropriate governance structures, cities can be places of innovation and efficiency. Together with their local authorities, they have the potential to diminish the causes of climate change (mitigation) and effectively protect themselves from its impacts (adaptation).

A highlight describing the causes of climate change are discussed within the chapter followed by a vulnerability assessment of the proposed Vipingo Mixed-use Development. The chapter also assesses the likely impacts from the envisioned development by Vipingo Master Plan which will contribute to climate change. Further it analyses the key adaptation and mitigation actions that need to be employed during the Master Plan execution.

8.2 The causes of climate change

The main sources of GHGs contributing to global warming include but not limited to increase in energy use, land-use changes and emissions from industrial activities. Urban households may also consume fuels more directly, in heaters and cookers, or indirectly in air conditioning or electric heating further impacting on climate change. Land-use changes induced by urban growth may lead to deforestation and reductions in the uptake of CO_2 by vegetation. Landfill sites taking up urban wastes also generate methane. Cement, as a construction material of primary importance to the development of urban infrastructure, as well as of commercial and residential buildings, also has a large carbon footprint due to an energy-intensive manufacturing process and high energy cost for transporting this dense material. Lastly, activities such as agriculture, livestock production, mining, and timber production, increase GHG emissions as direct emitters or reduce the uptake of these gases by vegetation.

Reducing the contribution of cities to climate change, or mitigation, requires an adequate understanding of the Rivers of urban GHG emissions, while effective adaptation must be based on a good understanding of what makes cities and their constituent socio-economic groups either vulnerable or resilient to climate change impacts. The exploration of how cities contribute to climate change requires an understanding of how transportation, heating and cooling systems, industries and other urban activities and infrastructures act both as emitters and direct causes of climate change. They create two main categories of impacts on the carbon cycle and the climate system:

a) ***Changes related to the emission of aerosols, GHGs and solid wastes*** - GHGs are the main source of changes in the climate system. Not only do they change the dynamics of the carbon cycle, but together with aerosols they also generate changes in the Earth's radiation that induce climate change. Wastes affect the growth, function and health of vegetation and of ecosystems in general.
b) ***Land-use related changes*** - Urbanization is a process that changes the use of land and by creating impervious surfaces, filling wetlands and fragmentation of ecosystems has disproportional impacts upon the carbon cycle. The built environment of urban areas is

also a forcing function on the weather–climate system of urban centres because it is a source of heat and a poor water storage system.

8.3 Vulnerability of Proposed Master Plan to Climate Change

Climate change has an impact on the urban environment. Climate change presents unique challenges for urban areas and their growing populations. With increasing urbanization, understanding the vulnerability of the envisioned development by proposed Master Plan to climate change is important. This has been addressed by assessing the likely impacts of climate change to proposed Master Plan land uses. The impacts are described in table below.

Table 8-1 Vulnerability of Proposed Master Plan to Climate Change

Key Aspects/ Sectors	Analysis on sectoral impacts
Heavy precipitation events	Heavy precipitation events are defined as the percentage of days with precipitation that exceeds some fixed or regional threshold compared to an average reference period of precipitation. Severe decreases in both precipitation intensity and volume have been documented in the recent past.
Extreme heat events	Climate change leads to an increase in temperature. Vipingo Mixed-use Development is likely to lead to increased cement and carbon surface area thus increasing the intensity of heat. Heat waves are typically defined as extended periods of hotter than average temperatures, although the precise timing and temperature differential varies regionally. As a result of climate change, extreme heat events are predicted to become more frequent, intense and longer lasting over most land areas.
Drought	Drought can be defined as a phenomenon in which precipitation is significantly below normal levels, which leads to hydrological imbalances that negatively affect land resources and production systems. Drought affects urban areas in numerous ways. It can compromise water quality and increase the operating costs of water systems while reducing their reliability.
Sea Level rise	This is because of increased temperature thus increasing the volume of ocean water and increased melting of ice
Residential and commercial structures	Residential and commercial structures may be significantly damaged by the increase in climate change related hazards such as floods.
Transportation system	Climate change has a major effect on transport. It may affect visibility on the road and accessibility to some areas thus causing interruptions in the development.
Energy systems	Climate change affects the demand of energy. This is caused by demand of use of cooling devices when hot and the use of heating devices when cold.
Water systems	Due to increased population, there is increased demand for water, which is already a limiting factor in Kilifi. In addition, due to increased temperatures, the volumes of water flowing in the streams will change.

Sectoral economic impacts	Climate change affects many economies such as tourism which is dependent on reliable conditions. Other industries include insurance whereby extreme climate events may affect a large area.
Livelihood impacts	Extreme climate events may lead to individuals and household changing their lives to sustain their livelihood.
Public Health Impact	Catastrophic events and extreme conditions resulted by climate change may cause immediate and lasting impacts such as death and prolonged illness. It may also increase in the transmission of certain infectious diseases.
Social impacts	Climate change influences various demographic aspects of the community i.e. both women and men, young and old are highly vulnerable. The poor are also highly vulnerable to extreme climate events. They are highly exposed to risks and lack capacity and finances to protect themselves (UN Habitat, United Nations Human Settlements Programme, 2011)
Ecosystem services	Increased population will impact and put pressure on the existing natural resources. This in turn affects ecosystem services such as oxygen production, carbon storage, natural filtration of pollutants and toxins and the protection of coastal societies from flooding and wind during storms.

8.4 Proposed Master Plan Sectors likely to be potential sources of GHGs

There are several reasons for the importance of considering the contribution of urban areas to climate change. First, there are a range of activities associated with cities and their functioning that contribute to GHG emissions. Transportation, energy generation and industrial production within the territorial boundaries of towns and cities generate GHG emissions directly. Urban centers rely on inward flows of food, water and consumer goods that may result in GHG emissions from areas outside the city during their transportation.

Second, climate-friendly developments have the potential to attract external investment, and the growing importance of international urban network provides spaces for learning and knowledge transfer. The measuring of emissions level has recently been inserted into global policy debates. For example, the United Nations Environment Programme (UNEP), the United Nations Human Settlements Programme (UN-habitat) and the World Bank launched an International Standard for Determining Greenhouse Gas Emissions for Cities. This standard provides a common method for cities to calculate the amount of GHG emissions produced within their boundaries.

Third, an assessment of the contribution of cities to climate change is a vital first step in identifying potential solutions. The large and growing proportion of the Earth's population living in towns and cities, and the concentration of economic and industrial activities in these areas, means that they need to be at the forefront of mitigation. The establishment of emission baselines is necessary if effective mitigation benefits are to be identified and applied.

Critical sectors identified to have the potential of contributing to the GHGs have been briefly described below.

8.4.1 Transport

Globally, transportation is responsible for about 23% of total energy related GHG emissions and 13% of global GHG emissions. Urban areas rely heavily on transportation networks of various kinds for both internal and external movements of goods and people. The road transport is the largest contributor to GHGs emission. The implementation of the proposed Master Plan will see increase in the number of vehicles on the roads. This as a result will have a negative impact on

the environment as it will increase consumption of petroleum products while releasing CO_2 and N_2O to the atmosphere.

8.4.2 Commercial and residential buildings

GHG emissions from commercial and residential buildings are associated with emissions from electricity use, space heating and cooling. Commercial and residential buildings are responsible for direct emissions (onsite combustion of fuels), indirect emissions (from public electricity use for street lighting and other activities, and district heat consumption), and emissions associated with embodied energy (e.g. in the materials used for their construction). Emissions are affected by the need for heating and cooling, and by the behaviour of building occupants.

8.4.3 Industries

Many industrial activities are energy intensive in their operation. These include the manufacturing industries, chemicals and fertilizer industries, cement, pulp and paper. Vipingo Mixed Use Development is envisaged to establish an industrial park that includes light and heavy industries. The light industries involve light processing of goods such as detergents, toiletries; plastics and pharmaceuticals while heavy industries involve large and heavy equipment or complex, numerous processes. Some of the industries can generate nitrous oxide, carbon dioxide and fluorinated gases which form the principle GHGs.

8.4.4 Waste

Despite being only a small contributor to global emissions, rates of waste generation have been increasing during recent years, particularly in developing countries that have been experiencing increasing affluence. Poor management of waste in landfills and dumpsites contributes to production of methane gas which is one of the major GHGs.

8.4.5 Agriculture, land-use change and forestry

Urban areas have a potential to shape emissions from agriculture, land-use change and forestry in two major ways. First, the process of urbanization can involve direct changes in land use, as formerly agricultural land becomes incorporated within built-up areas. Agriculture is one of the leading sectors in the removal of GHGs from the atmosphere. Second, the forested areas can be cleared to pave way for the development hence leading to a reduction in the forest cover. This can reduce the capacity of the forests and vegetation to carry out carbon dioxide sequestration.

8.4.6 Energy supply for electricity generation

Energy is perhaps the broadest possible category for assessing GHG emissions. The combustion of fossil fuels is the major source amongst them, and is used throughout the world for electricity generation, heating, cooling, cooking, transportation, and industrial production. Energy is obtained from fossil fuels, biomass, nuclear power, hydroelectric generation and other renewable sources. Urban areas rely heavily on energy systems, the energy structure (types of energy forms used) and the quality of the energy (its energetic and environmental characteristics). This section will thus focus on the use of energy for electricity generation in urban areas, the different sources of energy and the implications for GHG emissions. Hydroelectricity is the main form of electricity in the region, and it's powered by diesel generators. The generation of electricity from diesel generators contributes the highest to GHG emissions.

8.5 Adaptation and Mitigation actions for the Master Plan

The climate change adaptation actions are those that help in reducing the vulnerability of a development plan to the effects of climate change, while the mitigation actions are those that should be undertaken to avoid the increase of a pollutant emission. The following adaptation and mitigation measures should be considered during the execution of the Vipingo Mixed Use Development Master Plan.

Table 8-2 Adaptation and mitigation measures for the proposed Master Plan

Sector	Adaptation Actions	Mitigation Actions
Transportation	▪ Revision of the road construction designs and materials to incorporate those that are climate change proof	▪ Develop strategies to enable efficient means of transport that have a low GHG footprint
Commercial centers	▪ Revision of the existing building codes and standards to incorporate the use of climate change proof designs and materials ▪ Develop strategies for preventive and precautionary actions e.g. evacuation plans	▪ Put in place measures to enhance energy conservation, efficiency and use of renewable energy ▪ Put in place measures to ensure implementation of the revised building codes and standards
Industries	▪ Develop a policy to guide the design and operations of the industries	▪ Have in place measures to control and reduce GHG emissions by the industries such as carbon taxing
Agriculture development, and green spaces	▪ Develop policies to incorporate landscape restorations and reforestation in all development plans ▪ Develop strategies for flexible agriculture to prepare for natural catastrophes	▪ Develop strategies to enhance the agricultural and forestry zones which aid in carbon dioxide sequestration
Housing development / educational institutions	▪ Develop an integrated, improved early warning and response systems for climate change risks such as flooding ▪ Development and implementation of educational and public awareness programmes on climate change and its effects ▪ Ensuring that all new development are climate-proof over their lifespan ▪ Develop strategies to optimize the use of renewable and sustainable energy sources	▪ Mainstreaming of climate change into development planning and management for sustainability ▪ Have in place measures to enhance conservation of energy. ▪ Use of green building technologies
Infrastructure and utilities	▪ Ensure that all new infrastructure is climate-proof over its lifespan ▪ Revise the designs for the waste management systems such as landfills to those that can adapt to the effects of climate change ▪ Put in place emergency measures to deal with waste management during catastrophes	▪ Improve local water recycling facilities ▪ Develop strategies for waste reduction at source through implementation of Integrated Solid Waste Management Systems (ISWM) ▪ Develop strategies to enhance the waste treatment methods

Sector	Adaptation Actions	Mitigation Actions
Natural Green Open Space, wetlands and water bodies	▪ Discourage environmentally destructive land uses and improper non-green infrastructure whose impacts could eventually amplify the effects of climate change ▪ Protection and sustainable riparian zone / green zone management ▪ Establishment of rainwater harvesting reservoirs	▪ Increase tree cover in the green and open spaces of the Master plan to greater carbon sequestration, both in the soil and the biomass, ▪ Promote and institutionalize payment for ecosystem services schemes to support watershed protection initiatives in the upland's zones

9 GRIEVANCE REDRESS MECHANISM (GRM)

9.1 Introduction

A key principle of any development is to prevent or minimise grievances rather than going through a redress process. This can be achieved through commitment to full participation and consultation of the stakeholders and establishing extensive communication and coordination between the affected communities, and the envisioned development. However, this does not always preclude grievances from arising.

This Strategic Environmental Assessment (SEA) process provides opportunities for the likely to be affected parties to air and articulate their queries, concerns, issues, complaints, dissatisfaction or sense of injustice or unfairness, and seek to have these resolved amicably, and in the shortest time possible. Affected parties should be able to file a grievance for any disagreeable decision, practice or activity, arising from proposed Vipingo mixed use master plan development. Therefore, a Grievance Redress Mechanism (GRM) as a mechanism, or set of procedures and processes, or organizational systems and resources, has been established to be used as a means to hear, address and resolve issues and complaints related to Vipingo mixed use development masterplan implementation. The stakeholder input handled through these systems and procedures may be called grievances, complaints, feedback, or any other functionally relevant terminology or concept.

9.2 Potential Grievances

In practice, some of the possible grievances that can be anticipated or are most likely to occur during implementation of the master plan may include:

- Disagreement over opportunities offered to the community, for instance on job opportunities, loss of livelihoods, loss/decrease of business or income etc.;
- Interruption of public, community, social or other services and infrastructure e.g., water, and access to the beach
- Damage to un-expropriated public / community assets such as roads, beaches

9.3 Objective of a Grievances Redress Mechanism

Essentially, GRMs are designed as a conduit for soliciting inquiries, inviting suggestions, and increasing participation in developments. The proposed GRM has been established to:

- Generate public and stakeholder awareness about the proposed Vipingo mixed use master plan and its objectives;
- Increase stakeholder involvement in the mixed-use master plan;
- Improve proposed mixed use master plan outcomes: through timely resolution of issues and problems; the GRM will contribute to timely achievement of the master plan objectives
- Provide feedback to different levels of the mixed-use master plan performance i.e., providing management with practical suggestions/feedback;
- Act as an early warning mechanism / effective risk management tool to identify and resolve implementation problems in a timely and cost-effective manner:
- Build community relations / legitimacy among stakeholders; through creating and maintaining trust with affected persons and the stakeholders,
- Allow the development management team to be more accountable, transparent and responsive to stakeholders
- Deter or curb fraud and corruption; and,
- Assess the effectiveness of Vipingo Development Limited processes but also improve the operational processes and performance.

9.4 Guiding Principles for an effective Grievance Redress Mechanism

There are several guiding principles that drive the design of an effective GRM. GRMs that involve these principles are more likely to provide effective resolution of grievances. Table below highlights the key GRM principles

- **Start early in the project cycle:** GRM (or at least the lowest Level institution at PAP level should be put in place as early as possible, and later modified as need arises.
- **Simple and Accessible:** should be known to the intended users and accessible to diverse members of the community, with multiple points of entry and access.
- **Legitimate:** Enabling trust from the stakeholders intended to use it
- **Participatory and Inclusive:** should be developed in a participatory manner and include representatives from the main actors/categories relevant to the area
- **Contextualization and appropriateness** (e.g., Cultural and Context Sensitive): should be localized to ensure it's appropriate to the local context, keeping in line with local cultural or traditional structures for raising and resolving issues.
- **Responsive, Timely, and Efficient:** Should be responsive to the needs of all complainants, and resolutions should be reached in the soonest time possible to discourage lengthy suits that are time wasting.
- **Transparency / fairness / impartiality:** Users must be clearly informed how they can access the mechanism and be given fair and impartial resolutions without fear of reprimand.
- **Formalized:** the mechanism needs to be formally established, predictable and well known, and not ad hoc. It needs rules for addressing grievances, holds regular meetings/deliberations on specific and well-known days to discuss the issues. Clearly laid out and expected timetable for key process milestones is essential.
- **Appropriate Protection:** The mechanism should prevent retribution and should not impede access to other remedies such as legal reprieve.

9.5 The Grievance Structure

This SEA proposes a three (3) - tier grievance redress mechanism;

- Community / Stakeholders Level
- Management Level – Masterplan Implementation Team
- Board Level - Vipingo Development Ltd

The table matrix below shows GRM composition and functions.

Table 9-1 GRM composition and Functions

Institution	Membership	Functions
Grievance Redress Committee *Community Stakeholders Level*	• Established at the community / Stakeholders' level with membership from the Master Plan Area • Consists of a 9-member committee (exclusive of ex-official members) • Membership should be drawn from a variety of factors including affected persons (male, female, elders' representatives, Youth, in cognizance of local dynamics. • A representation of the local government administration i.e.	• Assist community / stakeholders to file a complaint. • To address affected persons grievances as 1st point of contact, within 15 days • Publicize the grievance management procedures. • Receive, review, investigate and keep track of grievances through the grievance logs/registers (with support of Community Liaison Person).

Institution	Membership	Functions
	chief and assistant chief as ex-official default members with no voting rights.	• Adjudicate and develop redress options for the raised grievances. • Monitor fulfilment of agreements achieved through the committee. • Provide inputs into the monitoring and evaluation process i.e. monthly reports on grievances.
If no amicable solution or settlement is reached, the aggrieved person is not satisfied or does not hear from the GRC through CLO within the required time limits (15 days), they can escalate the grievance to the next level		
Management Level – *The Master Plan Implementation Team*	• The Vipingo Mixed Use Development Master Plan Implementation team will consider grievance reports forwarded to it and make a determination. • Membership consists of the management team. • The CLO may be invited to the meeting to give a highlight and account of grievances.	• Escalation Mechanism to determine grievances unresolved by GRC within 15 days • Responsible for monitoring the complaints • Providing inputs into the monitoring and evaluation process i.e., quarterly reports on grievances handled.
Board Level *Vipingo Development Ltd*	• Through the Managing Director, the grievances not concluded at the management level can be forwarded to the Vipingo Development Board for approval and discussion.	• Resolves matters forwarded from the Master Plan Implementation team through an open hearing process and decision making
The aggrieved person can go Court as a last resort. Given the above mechanism it is not foreseen that many disputes will end up in court.		
Court of Law	• The Land and Environment court deals specifically with land and environment related disputes.	• Aggrieved part may seek legal redress and at their own cost. • The legal option will only act as avenue of last resort and will be sought after all other redress mediums have been exploited and exhausted.

9.6 Grievance Redress: Process, Procedures and Timelines

Grievance procedures may be invoked at any time, depending on the complaint. The following procedures should be followed:

9.6.1 Grievance uptake: Receipt and Lodge/Register

The community / stakeholders level grievance redress procedure should start with registration of the grievances with the community Liaison Officer (CLO). The CLO should convene a meeting with GRC, invite the aggrieved party to the meeting and present the grievance to the committee for hearing. It is envisaged that the GRC should acknowledge receipt of the complaints and grievances within two weeks and strive to resolve the matter within one month. The GRC should ensure that grievances reported to it are dealt with in a fair, consistent and timely manner, in

accordance with the GRM principles, agreed timelines and resolution modes. The GRC should seek to eliminate unreasonable or illegitimate claims which may be driven by other factors that are not genuine, or the mixed-use development related, and satisfy legitimate claimants.

The Community Liaison Officer (CLO) should be the link between the GRC and management team. If the GRC is unable to satisfy the claimant, then the matter will be escalated to the management team through the CLO. Being a support to the GRC, the CLO in agreement with the GRC should escalate the unresolved complaints to the management team, with documentation about the issue, how it has been dealt with by the GRC as well as the reason for the stalemate. A number of avenues should be made available to the affected parties for communication of grievances, e.g., through e-mail, text messaging, telephone calls, face to face interactions with members of the committees.

The CLO is responsible for receiving, referencing, registering, and filing all grievances through the grievance form. The CLO then logs the grievance into the grievance log or register giving each case a unique number, date complaint was lodged, complainant (if not a sensitive issue), nature of complaint, and in later stages action taken, or not taken, with reasons for the latter. Ideally, the use of the CLO ensures a centralized logging and tracking system – very essential for accountability.

9.6.2 Sorting and Processing: Acknowledge, Assess and Assign

The committee siting will assess the eligibility of the issue for the GRM mechanism while those not related to the mixed-use development are referred to the right process or organisation. Such may include complaints constituting criminal activity and violence.

For eligible complaints, these are categorized as

a. Comments, suggestions, or queries;
b. Complaints to be handled by GRC;
c. Complaints to be referred directly to Management team and other parties.

Some, e.g. (a) above may only require an immediate clarification or a simple explanation, while for (b) type of complaints, these will be assigned priority for investigation. In each, the action required is written down in the grievance registry.

Collaborative: Not all complaints should be handled through a GRM. For example, grievances that allege corruption, coercion, or significant and systematic violations of rights and/ or policies are typically referred to organizational accountability mechanisms or administrative or judicial bodies for formal investigation, rather than to GRMs for collaborative problem-solving.

9.6.3 Verification and Investigation

The GRC will then hold a meeting on the grievance and may work in consultation with the aggrieved person. In this step, they will also gather information on the grievance and decide on the corrective action within 15 days. The proposed action will be lodged in the register.

9.6.4 Develop and Communicate Response

The GRC will inform the complainant – through a meeting, followed by a summarised written communication of the decision and resolution – of the results of investigations and the actions proposed, seeking to seek agreement on the response. The actions can be:

- Direct action to resolve the complaint;
- Further assessment and engagement with the complainant and/or involving other actors to jointly determine the best way to resolve the complaint.

Two possible scenarios can result from this meeting:

- The aggrieved party accepts the proposed corrective action: A written agreement is developed, detailing the time frame for implementing the corrective action as well as responsible party. This is signed by the GRC chairperson or CLO and the aggrieved party,

and the corrective action commences. The acceptance is also lodged in the log, and later the completion date will be lodged after verification that recommended action was undertaken by the GRC, or concerned party.

- The aggrieved party rejects the proposed corrective: The aggrieved party rejects the proposed corrective: The default position is that case/matter is referred to management level

If the GRM does not result in an action acceptable to the aggrieved party, he/she can resort to the judicial recourse.

9.6.5 Action: Implement Response and Review if Successful

When there is agreement between a complainant and the GRC such as acceptance of a proposed action, thus enabling the process to move forward with the proposed action or stakeholder process, then the response should be implemented.

9.6.6 Closeout or refer the grievance

Where the response has been successful, the secretary of the committee and CLO should document the satisfactory resolution. It is best to have the complaint countersign to show their satisfaction with the response. The grievance is then indicated as closed.

9.6.7 Monitoring, Evaluation, and Providing Feedback

At all levels, regular progress monitoring of grievances filed, their status and actions taken and recommendations/resolution will be constantly undertaken. The management team is individually responsible for monitoring and tracking grievances, assessing the extent to which progress is being made to resolve them, and generate quarterly reports. These reports and data/lessons generated should be used to make policy and/or process changes to minimize similar grievances in the future or to adapt the GRM to correct or remove inefficiencies.

9.6.8 Documentation

At all levels, keeping of documentation should be ensured, including the grievance registers, grievance forms. Every meeting should have written minutes and approved by the relevant parties.

9.6.9 Sensitization and Capacity Building

To create demand for the GRM mechanism, thus avoidance of escalation of issues to court, Vipingo Development should undertake:

i. Sensitization of the affected parties on the grievance mechanism and its procedures

The effective working and use of the GRC depend on the awareness of its existence. Therefore, affected parties need to understand and support the purpose of the project GRM. The communications strategy should also reach out to disadvantaged and marginalized groups, which often cannot access GRMs. Communication methods and materials should include meetings, development website, bulletin boards in strategic sites (for instance at the CLO office) brochures summarizing the GRM process, and where possible be translated into the local Swahili languages as resources permit. Particular messages which need to be reinforced continually may include:

- The GRM is cost-free: there are no financial charges for affected parties to access or have the committees hear a dispute;
- The GRM is open to all;
- There exist mechanisms to escalate an issue if one committee is not able to address it satisfactorily;
- There is no retribution for complainants such as they are not punished;
- The types of grievances that can be submitted;
- The procedures to lodge a complaint and timeframes;
- Confidentiality can be assured where needed; and

- The development welcomes suggestions, recommendations, and grievances as they help improve the project's policies and systems.

ii. Capacity building of the GRC

The GRC should undergo training, e.g., on best practices in resettlement, grievance redress, monitoring, and evaluation to enable them be more effective in their work. The Committee members will also need to be oriented to the grievance management system. The capacities of the Committee members will also need to be built around issues of conflict identification, conflict information analysis, and conflict resolution. This exercise should include detailed terms of reference for the committees.

9.6.10 Client Commitment to Grievance Redress: Process, Procedures, and Timelines

The success of procedures and activities in the previous sections much depend on Vipingo Management commitment towards ensuring the effectiveness and efficiency of the system, thus requiring:

- Regular monitoring,
- Commitment to learning and adapting systems; and
- Provision of sufficient budgets and tools (e.g. grievance registers, forms, files, facilitation fees) to cover their operation and implementation of functions.
- Continuous capacity building of the committees.

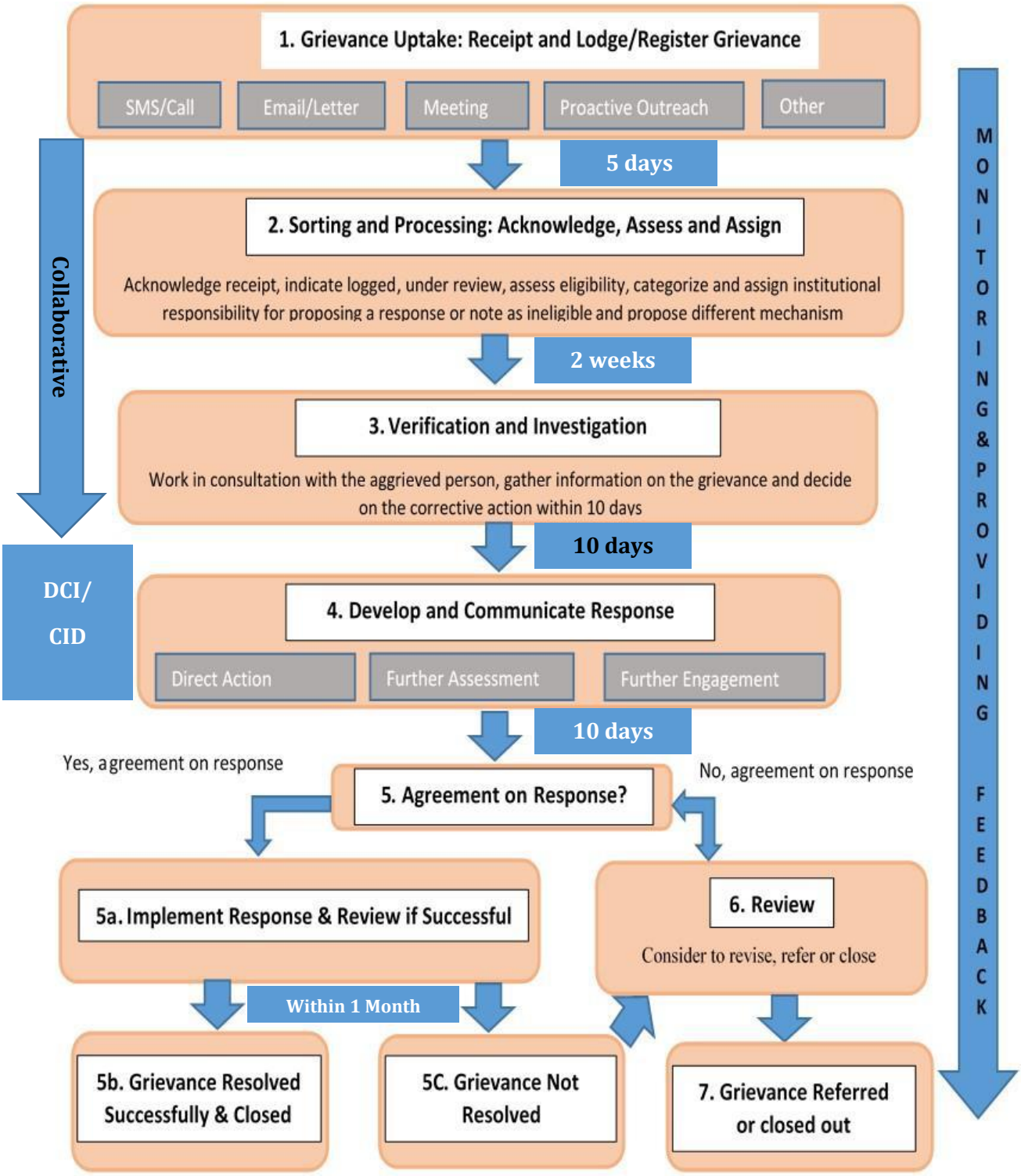


Figure 9-1 Summarized VIpingo Mixed Use Development GRM Process

10 ENVIRONMENTAL & SOCIAL MANAGEMENT AND MONITORING PLAN

10.1 Introduction

The Environmental and Social Management and Monitoring Plan (ESMMP) was prepared to show how specific development concerns and mitigation measures would be addressed through planning/design, and execution phases of the proposed Vipingo Mixed-Use Development Master Plan. It provides a link between the impacts of envisioned development activities during the Master Plan execution and the mitigation measures put in place to minimize these impacts and enhance the positive impacts.

In this SEA report, most of the proposed plan interventions are at a broader level and are only envisaged to provide strategic guidelines for the subsequent project specific ESMMP based on detailed component designs, construction, and operation plans. These will be formulated from site/project specific Environmental and Social Impact Assessments (ESIA) which will be undertaken before commencing implementation of the various specific projects. The ESMMP prescribes and directs the management of all environmental aspects of the Vipingo Mixed-Use Development Master Plan associated with and arising from planning, construction, and operation of the proposed components of the Master plan.

10.2 Scope and Objectives of the Environmental and Social Management and Monitoring Plan (ESMMP)

This ESMMP is an instrument that will allow Vipingo Development Limited, private developers, regulatory agencies, and other key stakeholders to integrate Environmental and Social components during implementation and execution of the various components of the proposed Vipingo Mixed-Use Development Master Plan. The aim is to detail the actions required to effectively implement the mitigation measures and alternative options for environmental and social obligation and enhance the positive impacts as recommended in the SEA. These actions are necessary to minimize the negative impacts which might originate from the plan implementation and support the long-term management and monitoring of the environmental and social issues during plan implementation.

The ESMMP has focused on mitigating the impacts identified during the Strategic Environmental Assessment process and established measures and procedures to control the identified impacts and monitor their progress. Specific objectives of this Environmental and Social Management and Monitoring Plan (ESMMP) are to:

a) Provide the National Environment Management Authority (NEMA) with a tool to make ease the evaluation of the objectives of the different phases of the proposed Master Plan considering Kenyan environmental legislation.
b) Provide guidelines for appropriate management and protection measures of environmental and social issues and concerns resulting from all activities associated with implementation of all phases of the Vipingo Mixed-Use Development Master Plan components.
c) Provide Vipingo Development Limited, private developers, regulatory agencies, and other key stakeholders their environmental and social responsibilities in implementation of all phases of the proposed Master Plan.
d) Assure the regulators, interested and affected parties the satisfaction of their demands in relation to environmental and social performance.
e) Provide detailed standards and specifications for the management and mitigation of activities that have the potential to impact negatively on the physical and social environment; and
f) Provide guidelines to project implementers regarding procedures for protecting the environment and minimizing negative environmental effects, thereby supporting the Master Plan's goal of promoting sustainable development.

Vipingo Development Limited, private developers, all investors and stakeholders within the proposed Master plan should comply with various conditions of implementing the Environmental and Social Management and Monitoring Plan (ESMMP) which include:

a) Ensure continuous compliance this ESMMP and adhere to the recommendations thereof.
b) Ensure sound environmental management by minimizing negative environmental impacts in all the activities they undertake and instead enhance on the positive impacts; and
c) Comply with all Kenyan legislation and policies regarding the environment and implement them accordingly

The ESMMP shall be expanded and may be modified where there is need to customize to specific project/development conditions.

10.3 Environmental & Social Management Plan (ESMP)

Environmental and Social Management is an essential component of the SEA Process. The SEA has recommended simple, straightforward and tangible management actions which are specific to each of the mitigation measures and alternative options. These can be considered as the direct environmental management prescriptions which will deal with the environmental challenges identified in the proposed Vipingo Mixed-Use Development Master Plan.

The various actions should be implemented to ensure that the environmental weaknesses are addressed for the good of the locality. The Environmental and Social Management Plan (ESMP) has been outlined in tables for each management action.

10.3.1 Biodiversity and Nature Conservation

Table 10-1: ESMP for Biodiversity and Nature Conservation

Potential Adverse Impact	▪ Ecological imbalance due to destruction of natural habitats for the local flora and fauna reducing biodiversity in the area ▪ Loss of agricultural land under sisal plantation and bushlands ▪ Disturbance/ Loss and fragmentation of habitats for snakes and rodents residing in the sisal plantations and bushes. ▪ Modification of mangrove vegetation ▪ Wildlife habitat deterioration due to low carrying capacity		
Objective	▪ Conservation of wildlife and biodiversity on site ▪ Conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources		
Management strategy	▪ Protection of species and habitats, enhancement of biodiversity on site		
Recommended Mitigation Measures		**Responsible Party**	**Time Frame**	**Cost**
▪ EIAs to be undertaken for all development activities ▪ Carry out landscaping of different zones ▪ Maintain the proposed green spaces as per the Master Plan ▪ The green open places and parks as per the Master Plan to be enriched with native vegetation ▪ Unless it is mandatory, avoid clearance of the existing indigenous tree species ▪ Carry out afforestation programmes ▪ Where clearance of native vegetation is inevitable, consider introducing such natives in landscaped and other green spaces to compensate for the loss ▪ Consider leaving isolated patches of indigenous vegetation to act as refuge to small wild game during implementation of the Master Plan ▪ Where feasible, allow for migration of the small wild game to the neighborhood undisturbed sites during implementation of the Master Plan ▪ Invest some of the land in other agricultural investments		▪ Vipingo Development Limited ▪ Developer / Contractors	During Plan Implementation	▪ Cost of EIAs and preparation of management plans to be determined at prevailing rates during plan implementation
Performance Indicators	▪ Number of rats and snakes			

	▪ Numbers of grasshoppers ▪ Relocation of animals to the Undeveloped & Agriculture Zone through the use of a wildlife management plan ▪ Size of mangrove trees ▪ Size of land under indigenous vegetation, sisal plantations, and bushlands
Monitoring Requirements	▪ Periodical ecological surveys ▪ Wildlife Inventory
Reporting	▪ Ecological Survey Report
Legal Obligation	▪ Wildlife Conservation and Management Act, 2013 ▪ The Environmental Management and Co-ordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009 and Conservation and Management of Wetlands Amendment Regulations, 2017

10.3.2 Waste Management

Table 10-2: ESMP for solid and effluent waste

Potential Adverse Impact	▪ High generation of solid and effluent waste from residential, commercial and industrial areas.		
Objective	▪ Eliminate impact on public health due to the poor waste management on location.		
Management strategy	▪ Removal of agents of environmental pollution and proper disposal of wastes.		
Recommended Mitigation Measures	**Responsible Party**	**Time Frame**	**Cost**
▪ Adoption and development of an Integrated Solid Waste Management Plan through a hierarchy of options that includes reduction at source, reuse, recycling, incineration, composting and land filling ▪ Pursue waste minimization at source principles e.g. zero generation, reduction, re-use and/or recycling ▪ Domestic, commercial and industrial waste to be managed separately ▪ Provide mechanisms to segregate wastes at source to enable recycling ▪ Provision of transfer stations from where waste will be disposed in designated areas ▪ Ensure all wastes are stored temporarily at the designated transfer stations, and that they are regularly carried away for disposal in designated areas ▪ Only contract licensed waste transporters ▪ Pre-treatment of industrial effluent before discharge into the environment and obtaining Effluent Discharge Licenses for the same ▪ Development of storm water management plan with design strategies for storm water treatment and filtration systems ▪ Provide wastewater treatment plants ▪ Undertake EIA for all development activities and implement the relevant project specific EMPs developed.	▪ Vipingo Development Limited ▪ Developer / Contractors	Throughout plan Implementation	▪ Cost of waste collection and disposal systems to be determined in the detailed planning for each phase of the development
Performance Indicators	▪ Housekeeping, littering, status of solid waste management ▪ Functional waste management facilities ▪ Re-use, recycling and treatment plants		
Monitoring Requirements	▪ Periodical inspection of waste management operations		
Reporting	▪ Environmental Audits and other statutory and non-statutory reports		
Legal Obligation	▪ Environmental Management and Co-ordination (Waste Management) Regulations 2006 ▪ Environmental Management and Co-ordination (Water Quality) Regulations 2006		

10.3.3 Water Resources

Table 10-3: ESMP for Water Resources

Potential Adverse Impact	▪ High water demand in residential, commercial and industrial areas and for recreational areas during construction and operational phases ▪ High water abstraction from boreholes, wells and/or the ocean ▪ Pollution of boreholes, wells and/or the ocean ▪ Decline in groundwater levels			
Objective	▪ Minimize impact on available water resources and ensure their conservation			
Management strategy	▪ Conservation of water resources through sustainable utilization			
Recommended Mitigation Measures		**Responsible Party**	**Time Frame**	**Cost**
▪ Promote integrated water management such as recycling and reuse of water as much as possible ▪ Conservative water use in low volume fixtures in buildings ▪ Development of storm water management plan with design strategies for storm water treatment and filtration systems. Such would entail use of recycled and harvested storm water in cleaning and Landscaping ▪ Incorporate water accounting systems and metering for all areas ▪ Promote and use alternative sources of water such as roof catchment rainwater harvesting and harvesting of flood waters ▪ Pre-treatment of all effluent before discharge into the environment ▪ Undertake a hydrogeological study in collaboration with WRA to determine the sustainable ground water abstraction levels ▪ Continually seek new avenues for water conservation as international best practices evolve ▪ Undertake EIA for all development activities		▪ Vipingo Development Limited ▪ Developer / Contractors	During Plan Implementation	▪ Cost of water efficient fixtures and appliances will be part of each project costs ▪ Cost of water monitoring including viable conservation measures to be determined and procured at prevailing rates during operations
Performance Indicators	▪ Water use levels ▪ Borehole yields			
Monitoring Requirements	▪ A water-use monitoring and evaluation schedule ▪ Metering			
Reporting	▪ Logs of inspections, utility records			

Legal Obligation	▪ The Water Act 2016, ▪ Water Resource Management Rules 2007 and Water Resources Management (Amendment) Rules, 2012 ▪ Environmental Management and Co-ordination (Water Quality) Regulations, 2006

10.3.4 Energy Resources

Table 10-4 ESMP for Energy Resources

Potential Adverse Impact	▪ Increased energy consumption ▪ High energy demand in residential, commercial and industrial areas		
Objective	▪ Minimize impact on available energy resources and ensure their conservation		
Management strategy	▪ Conservation of energy resources through lowering of consumption levels		
Recommended Mitigation Measures	**Responsible Party**	**Time Frame**	**Cost**
▪ Institution of awareness programmes to conserve energy ▪ Energy conservation through installation/use of energy efficient appliances / fittings ▪ Adoption of green energy sources e.g. solar energy, waste to energy projects ▪ Use of green building designs that allow for passive heating and cooling, and maximum utilization of natural light in buildings ▪ Continually seek avenues for energy conservation as international best practices evolve	▪ Vipingo Development Limited ▪ Developer / Contractors	During Plan Implementation	▪ Cost of energy efficient fixtures and appliances will be part of project costs ▪ Cost of energy monitoring including viable conservation measures to be determined and procured at prevailing rates during operations
Performance Indicators	▪ Energy use levels against benchmarks		
Monitoring Requirements	▪ Metering ▪ Energy use monitoring and evaluation schedule		
Reporting	▪ Energy Audit reports		
Legal Obligations	▪ The Energy Act, 2019 ▪ Subsidiary legislation under the Energy Act 2019		

	▪ International Best Practices

10.3.5 Environmental and Landscape Changes

Table 10-5 ESMP for Environmental and Landscape Changes

Potential Adverse Impact	▪ Negative visual impact due to loss of aesthetic value from dense urban structures ▪ Long term risk of evolution of urban heat islands and their effects ▪ Increased risk of flooding due to increase in storm water generated on site ▪ Poor ambient air quality and increase in background noise level		
Objective	▪ Ensuring positive landscape changes and enhancement of environmental quality		
Management strategy	▪ Protection of endangered/threatened/vulnerable species and habitats , enhancement of biodiversity on site		
Recommended Mitigation Measures		**Responsible Party**	**Time Frame**	**Cost**
▪ Ensure adequate tree cover and gardens within developed areas to provide shade and cooling effect ▪ Development of storm water management plan with design strategies for storm water treatment and filtration systems ▪ Ensure adequate drainage of the site through drainage works and storm collection systems ▪ Plenty of gardens and green areas within developed areas will enable percolation of rainfall and reduce runoff ▪ Ensure plenty of vegetation cover (trees and shrubs) as buffers between land-uses to reduce noise effects ▪ Undertake EIA for all development activities ▪ Enforcement of pollution control measures for air pollution sources ▪ Tarmacking all major roads to enhance movement in all-weather and to avoid dust generation		▪ Vipingo Development Limited ▪ Developer / Contractors	During Plan Implementation	▪ Cost of landscaping to be determined at prevailing rates during plan implementation ▪ Cost of EIAs and preparation of management plans to be determined at prevailing rates during plan implementation
Performance Indicators	▪ Percentage of green spaces in regards to developed spaces ▪ Size of buffer zones ▪ Background noise and ambient air quality ▪ Drainage systems effectiveness during heavy rains			
Monitoring Requirements	▪ Periodical surveys and measurements			
Reporting	▪ Air Quality tests ▪ Noise survey			

	▪ Audit Report
Legal Obligation	▪ Environmental Management and Co-ordination Act, Cap 387 ▪ Environmental (Impact Assessment and Audit) Regulations, 2003 ▪ Environmental Management and Co-ordination (Air Quality) Regulations, 2013 ▪ Environmental Management and Co-ordination (Noise & Excessive Vibration Pollution) (Control) Regulations, 2009 ▪ The Factories & Other Places of Work (Noise Prevention and Control) Rules, 2005

10.3.6 Traffic and Transport

Table 10-6 ESMP for Traffic and Transport

Potential Adverse Impact	▪ Increased human and vehicular traffic/ Risk of traffic congestion within Vipingo area. ▪ Increased traffic activity and traffic interruptions along the Mombasa-Malindi Highway		
Objective	▪ Ensure the smooth flow of pedestrian and vehicular traffic and minimize risks of accidents		
Management strategy	▪ Provision of adequate facilities and infrastructure ▪ Implementation of Non-Motorised Transport Systems ▪ Continually monitoring traffic incidences, establish their root cause and provide solutions		
Recommended Mitigation Measures		**Responsible Party**	**Time Frame**	**Cost**
▪ Provide for sufficient access roads within the proposed master plan ▪ Ensure a good connection between spine roads and the Mombasa-Malindi Highway ▪ Provision of adequate vehicular circulation space and parking areas ▪ Provision of pedestrian walkways along all roads within the development ▪ Paving all pedestrian walkways with robust, durable, and non-slippery materials ▪ Provision of all necessary street furniture along all roads within the development to accommodate users (including the disabled, elderly, and children) and to enhance security. ▪ Provision of bollards in appropriate areas to prevent vehicles from encroaching into the pedestrian domains. ▪ Provision of street lights to provide sufficient light for both pedestrian areas and carriage ways. ▪ Provision of trees, requiring minimum maintenance, along pedestrian walkways for shading; preferably indigenous for ecological and cultural advantages.		▪ Vipingo Development Limited ▪ Developer / Contractors ▪ Implementing agencies like KeNHA, KURA,	During Plan Implementation	▪ Cost of signage and warnings in hazard prone areas and other infrastructure shall be included in the project costs during construction ▪ Additional safety measures / features to be procured at

			prevailing rates during operations
Performance Indicators	▪ Traffic status ▪ Ease of access and circulation ▪ Traffic incidents and accidents		
Monitoring Requirements	▪ Regular monitoring of traffic flow ▪ Traffic Management Plan ▪ Physical Planning Handbook ▪ Traffic design and management guidelines		
Reporting	▪ Incidence logging		
Legal Obligation	▪ Traffic Act, Cap 403		

10.3.7 Climate change mitigation and adaptation

Table 10-7 ESMP for Climate change mitigation and adaptation - Greenhouse Gases Emission

Potential Adverse Impact	▪ Emission of greenhouse gases		
Objective	▪ Minimize emission of greenhouse gases in the atmosphere		
Management strategy	▪ Removal of agents of environmental pollution		
Recommended Mitigation Measures	**Responsible Party**	**Time Frame**	**Cost**
▪ Use of renewable sources of energy such as wind and solar energy ▪ Retention of green spaces/landscaped spaces as carbon sinks ▪ Recycling of solid/liquid wastes ▪ Adoption of clean production mechanism ▪ Adoption of green buildings technology ▪ Adoption of efficient transport system ▪ Continually seek avenues for energy conservation as international best practices evolve ▪ Annual air quality monitoring	▪ Vipingo Development Limited ▪ Developer / Contractors	Throughout plan Implementation	▪ Cost of EIAs and preparation of management plans to be determined at prevailing rates during plan implementation
Performance Indicators	▪ Reduced atmospheric greenhouse gases concentration ▪ Reduced climate change related illnesses ▪ Sustainable energy consumption- increased use of renewable energy sources ▪ Increased use of low-carbon technologies		
Monitoring Requirements	▪ Annual air quality monitoring		
Reporting	▪ Environmental Audits, stack emissions and other statutory and non-statutory reports		
Legal Obligation	▪ Climate Change Act, 2016 ▪ Environmental Management and Coordination (Air Quality) Regulations, 2014 ▪ International best practice		

10.3.8 Occupational Safety and Health

Table 10-8 ESMP for Occupational Safety and Health

Potential Adverse Impact	▪ High number of incidents, accidents, dangerous occurrences, fatalities / deaths reported during construction, operational and decommissioning phases of specific project implementation
Objective	▪ To provide for the safety, health and welfare of workers and all persons at workplaces
Management strategy	▪ Ensure all work places have and adhere to the Safety and Health policy and have operational health and safety committees

Recommended Mitigation Measures	**Responsible Party**	**Time Frame**	**Cost**
▪ All places intended to be used as a work place must be registered by DOSHS before they are occupied. ▪ All workplaces must have written procedures for hazard identification, risk assessments and Safe Work Method Statements (SWMS) for all activities intended to be done at site. ▪ Relevant safety signage and barriers should be put in place ▪ Have in place an emergency response plan for the development / occupational health and safety plan ▪ Health and safety trainings and awareness programmes should be carried out ▪ EIAs to be undertaken for all development activities	▪ Vipingo Development Limited ▪ Developer / Contractors ▪ DOSHS	During Plan Implementation	▪ Cost of EIAs and preparation of management plans to be determined at prevailing rates during plan implementation

Performance Indicators	▪ Number of incidents, accidents and dangerous occurrences reported ▪ Fatalities / Deaths reported during construction, operational and decommissioning phases of each project ▪ Number of fire service stations within the area ▪ Number of Police Stations/Posts and Disaster Operations Centre
Monitoring Requirements	▪ Workplaces registered by DOSHS within Vipingo Mixed-Use Master Plan ▪ Premises insured as per statutory requirements (third party and workman's compensation) ▪ Emergency preparedness and evacuation procedures ▪ Compensation Claims related to work injuries
Reporting	▪ Health and Safety Audits and other statutory and non-statutory reports ▪ Health and Safety Management Plan ▪ Emergency Response Plan
Legal Obligation	▪ Occupational Safety and Health Act (OSHA), 2007 ▪ Subsidiary Legislations under OSHA, 2007

	▪ Work Injury Benefits Act, 2007

10.3.9 Socio-Economic Concerns

Table 10-9 ESMP for Socio –Economic concerns

Potential Adverse Impact	▪ Disruption and change of local livelihoods ▪ Unemployment -Loss of employment opportunities for people working in the sisal plantations ▪ Increased crime rates ▪ Poverty ▪ Informal settlements ▪ Income disparity between the Mixed-Use and local communities ▪ Gender inequality		
Objective	▪ Improve livelihoods of people within and around the Master Plan land use area		
Management strategy	▪ Sustain and accelerate economic growth of Kilifi County and serve as a catalyst for further urban development.		
Recommended Mitigation Measures		**Responsible Party**	**Time Frame**	**Cost**
▪ Employment of locals and considerations in job allocations especially for activities requiring unskilled labour ▪ Ensure key labour rights as required by the Kenyan legislations including non-discrimination of gender, equal pay for work done, NSSF, NHIF and joining of Unions are part of the local recruitment / labour management plan. ▪ Develop livelihood restoration plans for the people at risk of losing employment in the sisal plantations ▪ Develop community awareness programmes to enhance cohesion between project employees and the local community. ▪ Mainstreaming gender requirements in the development opportunities ▪ Undertake public participation at the EIA stage for all individual projects		▪ Vipingo Development Limited ▪ Developer / Contractors	Throughout plan Implementation	Cost of EIAs and preparation of management plans to be determined at prevailing rates during plan implementation
Performance Indicators	▪ Gauge impact of Master Plan implementation on livelihoods ▪ Land value trends ▪ Development of market centres ▪ Grievance redress records		
Monitoring Requirements	▪ Records of hired manpower and remuneration		
Reporting	▪ Statutory and non-statutory reports		

Legal Obligation	▪ The Employment Act, 2007, Gender Act, Labour Act,

10.3.10 Socio- Cultural protection

Table 10-10 ESMP for social cultural concerns

Potential Adverse Impact	▪ Community / religious conflicts ▪ Degradation / erosion locals' cultural values and norms ▪ Loss of sense of belonging / identity for the community ▪ High crime rate		
Objective	▪ Protection of cultural resources through Master Plan land use		
Management strategy	▪ Sustain and protect cultural resources for future generations.		
Recommended Mitigation Measures	**Responsible Party**	**Time Frame**	**Cost**
▪ Work together with residents and local elders to identify any physical cultural resource and other areas of cultural heritage importance, not identified during SEA process ▪ Work in close liaison with national agencies that deal with areas of archaeological and cultural importance such as the National Museums of Kenya (NMK) to offer guidance in 'chance finds procedure' if unknown heritage resources, particularly archaeological resources, are encountered during master plan execution ▪ Ensure stakeholder's engagement to ensure effective communication in relation to cultural resources with the community. ▪ Establishment of grievances redress mechanism for the master plan execution ▪ Establishment of local cultural recreation centre ▪ Implement masterplan in phases to ensure gradual cultural adaptability of locals ▪ Undertake EIA projects for individual projects to assist in identification of any existing cultural resource s ▪ Ensure all developers / specific project contractors have in place 'chance find procedure/	▪ Vipingo Development Limited ▪ Developer / Contractors	Throughout plan Implementation	Cost of EIAs and preparation of chance find procedure to be determined at prevailing rates during plan implementation
Performance Indicators	▪ Gauge impact of Master Plan implementation on culture ▪ Grievance redress records ▪ Protected / discovered cultural resources		
Monitoring Requirements	▪ Records of signed / approved chance find procedure		

Reporting	▪ Statutory and non-statutory reports
Legal Obligation	▪ The National Museums and Heritage Act 2006

10.4 Environmental and Social Monitoring Plan

The Environmental and Social Monitoring Plan is vital for any Strategic Environmental Assessment for development plans. The monitoring plan will help in assessing the effectiveness of proposed mitigation measures, in assessing changes in environmental conditions and to provide warning of significant deterioration in environmental quality for further preventive action.

The principle elements of a monitoring plan are:

- A clear statement of aims and objectives
- A description of sampling sites
- A description of variables that will be measured
- A plan for quality control and quality assurance
- An estimate of the resources required to implement the design
- Delineation of responsibility to implement the monitoring plan
- Proposed frequency and timing of sampling

Specific attention has been made to ensure that the monitoring plan conforms to the following criteria, it is auditable in that it:

- Associates mitigation and monitoring tasks to specific impacts,
- Conforms to all best practice principles by acknowledging the existence of both long term and immediate impacts and the resulting mitigation measures necessary to deal with such,
- Delineates key lines of accountability,
- Ensures flexibility to enable incorporation of additional monitoring and mitigation techniques as deemed necessary throughout the life of the development,
- Gives guiding costs of implementation,
- Identifies key corporate commitments made by the proponent, with regard to its environmental performance,
- Identifies specific quantifiable monitoring regimes,
- Where practically possible identifies key indicator, which can be utilized for environmental performance monitoring.

Monitoring Requirements

To ensure that the whole SEA is effective, environmental monitoring is mandatory. Because of the complexity of cumulative effects at a strategic level, there will be uncertainty about impact predictions. Monitoring is therefore important to assess the accuracy of the predictions and to monitor the effectiveness of mitigation measures.

The monitoring frequency and indicators have been recommended for each management action. Regular monitoring using the recommended indicators will indicate the level of progress regarding ensuring environmental sustainability in the proposed Master Plan.

The parameters of the proposed Vipingo Mixed-Use master plan that were identified for monitoring include: water quality, air quality, solid waste generation, Occupational Health and Safety risks, soil erosion, storm water drainage, and livelihoods. This is represented in the table below.

Table 10-11 Environmental Monitoring Plan for Vipingo Mixed-Use Master Plan

Environmental Component	Points to be monitored	Parameters to be monitored	Lab Materials and Equipment/Other Requirements	Frequency of monitoring	Responsibility
Water Quality and Quantity	▪ Ground water resources Borehole ▪ County Government of Kilifi supply Kilifi-Mariakani Water and Sewerage Company (KIMAWASCO) ▪ Runoff from buildings ▪ Water treatment plant	▪ pH, Total Suspended Solids (TSS) and Total Dissolved Solids (TDS), heavy metals, oils and grease ▪ Residential, commercial, and industrial water and effluent Quality (physical and biochemical composition) and Quantity ▪ Abstraction rates and drawdown for boreholes ▪ Waterborne diseases prevalence	▪ Sampling bottles ▪ Cooler box ▪ Access to a NEMA accredited laboratory	▪ Quarterly or at least two times a year to cover seasonal variations	▪ Vipingo Development Limited ▪ WRA ▪ KIMAWASCO
Air Quality	▪ Commercial and industrial zones ▪ Water treatment plant ▪ Construction sites, Quarrying and/or Earth Borrowing sites, campsites	▪ TSP, NO_x, SO_2, CO, Dust particles, particulate matter	▪ Air sampling equipment	▪ Continuous ▪ Throughout Construction and operational Phases	▪ Vipingo Development Limited ▪ Developers /Contractor ▪ NEMA
Solid and Liquid Waste Generation	▪ Industrial, residential, and commercial zones. ▪ Water treatment plant.	▪ Domestic refuse, metallic scraps, sludge, waste composition, treatment methods ▪ Waterborne diseases prevalence ▪ pH, TSS and TDS, heavy metals, oils and grease	▪ Sampling bottles, cooler box, Access to a NEMA accredited laboratory ▪ Waste sampling bins, plastic bags, boxes, weighing machine	▪ Continuous	▪ Vipingo Development Limited ▪ NEMA ▪ Government lead Agencies
Biodiversity Loss	▪ Land area under sisal plantation, forests	▪ Individual species count (capture recapture) ▪ Biomass Index	▪ Periodical ecological surveys and mammal counts	▪ Continuous	▪ Vipingo Development Limited

Environmental Component	Points to be monitored	Parameters to be monitored	Lab Materials and Equipment/Other Requirements	Frequency of monitoring	Responsibility
	around the proposed area and bushlands.	▪ Rainfall volume, ▪ Topography	▪ Wildlife inventory ▪ field survey maps ▪ Rain-gauge		▪ KFS, KWS ▪ NEMA ▪ KMFRI
Soils (Fertility, Erosion, Compaction)	▪ Project construction sites ▪ Excavated areas, sloppy areas ▪ Water sources	▪ Soil salinity, ▪ Humus content ▪ Turbidity in storm water and other water sources ▪ Floods	▪ Laboratory analysis, ▪ Field equipment for soil sampling/ analysis	▪ Continuous	▪ Vipingo Development Limited ▪ Developers /Contractor
Occupational Health and Safety risks	▪ Project construction sites ▪ Industrial zones	▪ Total number and types of accident and incident reports and records, ▪ Accident locations ▪ Safety training for workers	▪ Incidents log-book ▪ Accident recording book ▪ Camera, ▪ GIS/GPS device ▪ Medical centres / dispensaries within the area ▪ Field inspections and information from lead agencies	▪ Continuous	▪ Vipingo Development Limited ▪ Developers /Contractor ▪ NEMA ▪ DOSHS
Socio-Economic	▪ Planning and Implementation phase of the Master Plan	▪ Number of jobs created ▪ Incomes, ▪ Quality of life (type of homes), ▪ Access to potable water,	▪ Quantitative and ▪ Qualitative analysis	▪ Annually	▪ Vipingo Development Limited ▪ Project committees

10.5 Construction Environmental Management and Monitoring Plans (CEMMP)

Implementation of specific projects within Vipingo Mixed-Use Master Plan will be preceded by project-specific Environmental Impact Assessments (EIAs). Environmental & Social Management Plans and Monitoring Plans developed in these EIAs shall be in line with the Strategic Environmental Assessment ESMMP developed for the proposed Master Plan.

The contractors who shall be appointed for construction of the various developments shall develop their own ESMMPs to ensure actions and mitigation necessary to protect the environment are incorporated into all site procedures. As a minimum, the CEMMP to be developed must address the following issues identified as key in the proposed Vipingo Mixed-Use Master Plan:

- Physical setting, flora and fauna;
- Solid and Liquid waste management;
- Storm-water, runoff and soil erosion;
- Air quality (Dust and Exhaust emissions);
- Water resources;
- Energy resources;
- Noise and vibrations;
- Traffic Management; and
- Occupational Health and Safety;

At a minimum, a contractor's ESMMP must address the following:

- Policy
- Planning
- Implementation and Operation

a) Policy

The contractor will develop an environmental policy that includes, as a minimum, the following:

- A commitment to comply with applicable regulations and other requirements that the company subscribes to;
- A commitment to provide a safe work environment;
- A commitment to provide the training and equipment necessary for employees to conduct their work safely;
- A commitment to continuously improve performance and to pollution prevention;
- A commitment to communicate the policy to all persons working for and on behalf of the company;

b) Planning

Environmental issues, legal and other requirements for the development have been identified in the SEA. These shall be further expounded in subsequent EIAs for the various projects within Vipingo Mixed Use Masterplan. The Contractor must demonstrate within his plan that he has read and understood the SEA and EIA Reports and their provisions for environmental management and monitoring.

c) Implementation and Operation

Roles, responsibilities, and authorities should be defined, documented, and communicated to ensure effective environmental and social management. A specific management representative should be assigned who is responsible for ensuring that the CEMMP is established, implemented and maintained and is responsible for reporting performance, reviewing the Plan and making recommendations for improvement. Documented confirmation is required that the training needs of all persons working for or on the company's behalf whose work pose significant hazards

to their health and safety and / or may create a significant impact on the environment has been identified. Records of all training must be maintained.

Management, Supervisory, and Employee responsibilities must be communicated to all employees through training, formal job descriptions, work experience, hiring practices, etc. Awareness training should be provided that includes the importance of conforming to the policy and procedures, the significant environmental, and the roles and responsibilities of management and staff.

Records should be legible, identifiable and traceable to the activity. Records should be stored and maintained in such a way that they are retrievable and protected against damage, deterioration or loss.

The contractor should establish, implement and maintain procedures to identify potential emergency situations and potential accidents that can have an impact on the environment, surrounding communities, the employees, and / or the public. The contractor should be prepared to respond to actual emergency situations and accidents and prevent or mitigate associated adverse environmental or social impacts. The EMP must also address how the contractor will receive, document and respond to external interested parties.

10.6 Institutional Arrangements

The SEA study identified the relevant institutions, agencies, authorities or persons and their respective roles on SEA to ensure effective implementation of the ESMMP. The following identified entities discussed below ought to be involved in the implementation of the EMMP throughout the plan cycle or as deemed fit.

There is need for close and committed monitoring of all the development activities to ensure environmental sustainability of the Vipingo Mixed-Use Master Plan. The study has therefore proposed that Vipingo Development Limited establishes an Environmental Management Unit (EMU) to take responsibility of overseeing the implementation activities. Such a unit can be run by a team of three officers consisting of an Environmental Health and Safety Manager and three assistants. Their main responsibilities will be to understand the environmental requirements of the Master Plan, ensure full implementation and maintenance of the recommended actions, reviewing the Plan and make recommendations for improvement where need be, monitor environmental parameters using the appropriate indicators, reporting performance and ensuring compliance by all agencies.

The unit representatives will be expected to understand all the environmental, health and safety laws and by-laws relevant to implementation of the ESMMP and all the equipment required to monitor environmental parameters.

Secondly, the unit will be expected to liaise with the departments responsible for environmental matters at the Kilifi County Office, National Government Agencies, and the implementing agencies to ensure effective implementation of the EMMP. Key implementing agencies include County Government (s), local Water and Sewerage Company, Kenya Power, Kenya National Highways Authority (KeNHA), Ministry of Lands and physical planning, local Non-Governmental Organizations (NGOs), Beach Management Units (BMUs), all government parastatals, among others.

NEMA is the key institution of the government overseeing implementation of environmental policy and laws in Kenya. The authority will take responsibility for general supervision and coordination of all environmental matters. In addition to reviewing environmental reports on the progress of proposed Master Plan, the authority's inspectors may visit any of the projects, during implementation, make reports and suggest improvements to ensure compliance to the recommended quality standards.

The institutional arrangement for implementing the proposed Vipingo Mixed-Use Master Plan is summarized in the Table 9-12 below:

Table 10-12 Institutional Arrangements of Implementing Environmental Components of the Master Plan

S/No	Institutions	Key responsibilities
1.	Vipingo Development Limited Environment Management Unit (EMU)	▪ Vipingo Development Limited to participate in the entire ESSMP process as part of the owner. ▪ EMU to oversee implementation of the proposed Master Plan as conducted by contractors/investors from construction, reviewing and verifying the implementation of the ESMMP of the proposed Vipingo Mixed-Use.
2.	National Environment Management Authority (NEMA)	▪ Review the draft SEA report and approve of the Final SEA ▪ Review Environmental Impact Assessment (EIA) and Environmental Audit (EA) reports for the different investors/projects. ▪ Approve EIA and EA reports. ▪ Deal with cases of non-compliance.
3.	Kilifi County Government (All relevant departments and ministries)	▪ Provide oversight and advisory services during the Plan implementation
4.	National Government Ministries	▪ Policy direction on implementation of the Master Plan ▪ Approval of Master Plan activities ▪ Training and mobilizing - Facilitate capacity building of young entrepreneurs. ▪ Facilitating technology development and transfer.
5.	Governmental Parastatals / Implementing Agencies	▪ Provision of infrastructure utilities and services like road networks, Electricity power supply ▪ Monitoring and Evaluation - quality control and product standards
6.	Water Resources Authority (WRA)	▪ Monitoring of water abstraction rates. ▪ Monitoring of water quality - pollution of water sources –rivers and boreholes.
7.	Kilifi- Mariakani Water and Sewerage Company (KIMAWASCO)	▪ Efficient and sustainable water supply management ▪ Supply of clean water to the proposed Vipingo Mixed-Use ▪ Providing sewer services ▪ Regular monitoring of sewer quality before draining into the public sewer.
8.	Vipingo Development Limited, Private developers and Investors	▪ Construct and invest according to the laid down development and environmental guidelines and regulations ▪ Comply with county, national and international quality standards

10.7 Institutional Strengthening/ Capacity Building

Vipingo Development limited will require an effective Environmental Management Unit (EMU) to ensure implementation of the Environmental Management and Monitoring Plan (EMMP) developed for the master plan. The unit will require strengthening and capacity building. This should incorporate key aspects as follows:

- Equipment / facilities requirements – an indication of type of equipment and number of units needed
- Training/study tours - information regarding type of training, number to be trained, duration of the training, organization providing the training and cost.

Table 10-13 Equipment / facilities requirements

S.N.	Type of Equipment / Facility	Requirements	Units	Purpose
1.	Duly Equipped water testing laboratory ▪ *Electronic meters to test water pH, turbidity, salinity and electrical conductivity,* ▪ *Microbiological testing,* ▪ *Heavy metals* ▪ *Carbon Dioxide Analyzer (CO^2 Gas Analyzer)* ▪ *Dust Monitor* ▪ *Soil Testing Kit (tests for: pH, nitrogen, phosphorus and potassium)* ▪ *Noise meters*	Registration and approval by Water Resources Authority NEMA accreditation /approval KEBs Accreditation	1	▪ Monitoring of water abstraction rates. ▪ Monitoring of water quality ▪ Monitoring pollution of marine life, the beach and boreholes ▪ Water & effluent analysis ▪ Carbon dioxide analyzers will be uses for monitoring purposes and control of CO2. ▪ Monitor the concentration of particles and fine particles such as dust, smoke, pollen, and other aerosols that are in the air. ▪ To monitor soil acidity or alkalinity. ▪ To monitor noise and vibrations
2.	Incinerator ▪ *Biomedical incinerator*	NEMA approval KEBs Accreditation	1	▪ Combustion of biomedical waste.
3.	Fully equipped Waste Management Centre / Sustainable solid waste management facility	NEMA approval	1	▪ An Environmental Management Unit (EMU) to be established for materials recovery and full implementation of the waste management plan ▪ Waste sorting for recycling purposes

	▪ *Equipped office with computers, internet, printer, photocopy machine, desks and seats amongst other office amenities* ▪ *Equipped Waste Recycling / collection station with clear segregation chambers / sections* ▪ *Waste collection bins* ▪ *Labelled Street litre bins/* ▪ *Skips*			▪ Waste segregation to be set up which will be responsible for collection and disposal of solid waste. ▪ Vipingo Development Limited will encourage best/sustainable management practices such as the 3Rs to ensure that the waste that ends up in dumping site is minimal.
4.	▪ *Waste / transportation vehicles*	NEMA approval for Waste transportation County Government of Kilifi	No. of vehicles dependent on waste production	▪ Waste Collection ▪ Waste transportation ▪ Waste disposal at land fill

Table 9-14 highlights some of the key trainings, professional courses / requirements, and studies needed for effective capacity development on implementation of the SEA.

Table 10-14 Training, Research and Studies

Training / Professionals Courses Required	Duration of the training	Scope / purpose / Skills required	Organizations / Institutions providing the training and cost.
Environmental Planning and Management / **Environmental studies (community Development)**	Degree Bachelor's 4 Years Master's 2 years	Integration of holistic planning and Management of land development with consideration of natural environment, social, political, economic and governance with goal to sustainable development	▪ Pwani University
Energy auditor	PhD. 4 Years	To preserve energy and reduce energy usage by inspecting buildings to find and fix leaks to help people use fewer resources.	

Environmental engineers		To use the principles of engineering, soil science, biology, and chemistry and create solutions to environmental problems—like improvements to recycling, waste disposal, public health, and water and air pollution control.	▪ Kenyatta University ▪ University of Nairobi ▪ Jomo Kenyatta University ▪ Dedan Kimathi University ▪ Egerton University ▪ Moi University ▪ Other approved Universities and intuitions of higher learning ▪ Vocational Technical Colleges (Amboseli Institute Thika, Nairobi Institute of Business studies) ▪ Technical institution Kenya Medical Training College (KMTC) Technical University of Kenya; etc). *Costs are dependent on the respective program rates by learning institutions*
Hydrologist / Chemist		Expertise of water quality and availability, To collect samples, or reading monitoring equipment, and analyze data and model their findings.	
Wildlife biologist		To study animals and their behaviour to see how they interact with their natural habitats.	
Earth Sciences		Encompasses Geology; Meteorology and Climatology.	
Conservation scientist and forester		Manage the overall land quality of forests, parks, riparian zones and other natural resources. Their duties will include protecting and enhancing habitats for animals, facilitating public recreation.	
Environmental Health and safety Specialists		Conducting environmental health investigations or inspections. Enduring occupational health and safety during project construction, operations and decommissioning.	
Solar photovoltaic installers	2-3 years Diploma/ Higher Diplomas from Technical Institutions	Often called PV installers, these workers will assemble, install and/or maintain solar panel systems, which are great sources of renewable energy.	
Plumbers		To deal with plumbing issues (repairs and maintenance) and fixing leaks Utilities record keeping	
Electricians		To deal with electrical wiring (repairs and maintenance) etc	

		Utilities record keeping	
Vocational training	On job trainings	Other services including: Refuse management; Gardening, Tree management and Cleaning	

11 CONCLUSION AND RECOMMENDATION

11.1 Conclusion

The proposed Vipingo Mixed Use Development Master Plan by Vipingo Development Limited is a worthy investment that will contribute significantly to the improvement of living standards among the investors and by extension spur economic development both in Kilifi County and neighboring regions. Upon the master plan execution, the proposed mixed use development will bring along numerous positive impacts ranging from creation of employment, supply of the much-needed office, retail/commercial/industrial and residential spaces, decongesting the nearby Kilifi, Malindi and Mtwapa towns including Mombasa City. It will lead to optimized land use among other benefits, all aimed at attaining the Kenyan vision 2030 and realizing key tenants of the Big Four Agenda.

It is therefore recommended that the mitigation strategies and ESMMP provided in this SEA report be duly implemented. In line with the EMCA Cap 387, Environmental Impact Assessments should be carried out for all individual projects before construction. The proponent should also ensure that the buffer zones between the various proposed master plan land use zones are sufficient and sustainable.

Taking into consideration the scope and magnitude of the proposed Vipingo Mixed Use Development Master Plan, the anticipated positive impacts, and the mitigation measures provided for identified negative impacts; it is our recommendation that NEMA approves this SEA Final Report. The developer has committed sufficient resources to the implementation of the SEA Approval conditions, the ESMP and relevant applicable local legislations including good international industry practices to the letter.

11.2 Recommendations

A description of recommended Vipingo Master Plan changes is identified in this subsection including mitigation measures for the Master Plans based on analysed impacts. Also included are various projects and developments that must undergo an EIA, the minimum components for subsequent EIAs with an aim to develop environmentally friendly, economically viable, and socially acceptable systems for the development.

11.2.1 Recommended Master Plan Changes

Vipingo Development Limited will continue to modify and update the land use zones and subdivision ordinances to promote a more thoughtful and holistic approach that is compatible with and compliments the character of its surroundings to ensure optimal and sustainable land use of the proposed development.

11.2.1.1 Designation of a Solid waste management facility

The Master Plan has not provided for solid waste disposal. The Kilifi County Integrated Development Plan (2018-2022) identifies poor urban area solid waste management as a problem in the County and proposes the acquisition of suitable land for dumpsites. A sustainable solid waste management facility / centre therefore is crucial to ensure adequate solid waste management. Such a facility should consider innovative solutions including waste to energy investment. It is therefore recommended that a suitable site be identified for solid waste management (including bio-hazard waste). Solid waste management should be anchored on an Integrated Solid Waste Management System (source reduction, recycling and composting, waste transportation, combustion and landfilling) for the development.

11.2.1.2 Location of Industrial zone from residential zone

The Master Plan has allocated land uses for industrial zone in proximity with medium residential. Based on the anticipated negative impacts from industrial zones, there is need to consider the proximity distances and establish a control system to avoid negative impacts to the residential areas.

11.2.1.3 Establishment of storm water treatment / filtration systems

Vipingo Mixed Use Development should develop a local storm water management plan that includes design strategies to protect sensitive open space areas, minimizing site disturbances, and using the land's natural treatment functions. An option of providing a space for storm water ponds can also be incorporated to recharge underground water.

11.2.2 Recommended SEA Mitigation strategies

11.2.2.1 Protection of Bushland and Mangroves

As per the Master Plan, there will be landscaped areas in the mixed development. The species that will be used for landscaping will greatly minimize the negative impacts that are expected to arise from the bushland loss. It is advisable that Vipingo Development Limited considers incorporating the native bushland species in the landscaping process. Use of 100% exotic species in the proposed landscaped areas is undesirable. Leaving some sections such as the land proposed for university/research under bushland vegetation will go a long way in reducing loss of natural vegetation. Innovative approaches to landscaping management such as recreation green spaces including nature trails, arboretum, should be integrated in the masterplan.

The proposed Vipingo Mixed Use Development land uses such as industrial, commercial and hospitality may have spill over effects which will probably affect the mangrove forest in the neighbourhood. Key threats that have been facing the mangrove forest over the years include pollution through liquid wastes discharge to the ecosystem and forest disturbances especially by salt processing companies. It is expected that the proposed development will put in place all the necessary precautions to cushion the remnant mangrove stretch from possible negative spill-over effects of the proposed mixed use development.

11.2.2.2 Protection of riparian land / resources/ wetlands

Vipingo Development Limited should ensure no development activity is undertaken within the full width of a River or stream to a minimum of six (6) metres and a maximum of 30 metres on either sides based on the highest recorded flow levels. This is according to Environmental Management and Coordination (Water Quality Regulations), 2006, Part II section 6 (b) and (c) that provides regulations on protection of Lakes, Rivers, Streams, Springs, Wells and other water sources. The way leave will allow for preservation, protection and management of riparian areas which are endowed with several natural resources that need to be protected through a better and effective system of management.

The constitution of Kenya (GOK, 2010) Chapter 5 - Land and Environment - in article 62 1 (l) states that public land is 'all land between the high and low water marks' which translates to all riparian zones being public land and therefore Vipingo Development Limited ensure no development activities encroach on riparian zones. Other key legislations on riparian land protection include; Water Resources Management Rules, 2007, Agricultural Act (Cap318), Forest Conservation and Management Act, 2016, the Land Act 2012, the Water Act, 2016 and the Wildlife (Conservation and Management) Act 2013.

Conservation and protection of wetland resources should form part of the Master Plan activities. Wetlands including the beachline within the Master Plan area should be mapped and protected to

reap ecological and other benefits associated with these areas. For instance, the beach section should be protected to conserve the turtle breeding, ensure access of local fishermen. The local communities and fishermen should be actively involved in the development activities and be made part of the decision-making process on matters linked to the Master Plan. Catchment destruction should be controlled, and the areas conserved by involving local stakeholders in environmental conservation process. Vipingo Development Ltd should partner with KWS for enhanced beach management and protection including beach cleaning and offering support such as fish storage facilities for local fishermen.

11.2.2.3 Habitat and Wildlife management

Vipingo Development Limited in consultation with KWS should prepare an Integrated Wildlife Management Plan (WMP) and provide an inventory of the wildlife species within the Master Plan for adequate management of the species. Where feasible the plan should allow migration of the small wild game to neighbourhood undisturbed sites during implementation of the Master Plan. Alternatively, Vipingo Development Limited may consider putting up an orphanage/park (snake park) and introduce native wild game.

11.2.2.4 Leverage for controlled urban planning on the Master Plan boundary

There is need for effective planning to deal with the possible mushrooming of informal settlements along the boundary of the mixed-use development. Vipingo Development Limited should work in collaborative partnerships with the planning department of Kilifi County. This will ensure support on the development compatibility with the neighbourhood scale and character. Low-density residential subdivisions and development should be discouraged from developing adjacent to arterial roadways which are anticipated for long-range widening and improvements unless appropriate transitional zoning or buffering is provided.

11.2.2.5 Harnessing power from renewable energy sources to supplement supply from the National Grid

Implementation of the proposed Master Plan land uses including residential zone, office and commercial zone, industrial zone, hospitality zone and institutional zone will result in higher energy demand. Vipingo Development Limited should therefore encourage developers within the Master Plan to explore options for establishing sustainable energy systems. This can be attained by reducing energy consumption particularly in respective designs of buildings. Further, solar energy should be harnessed to supplement supply from the National Grid.

11.2.2.6 Incorporating Green Building Techniques in construction of individual projects

Green building (also known as green construction or sustainable building) should be adopted through the application of processes that are environmentally responsible and resource efficient. Green building technologies should be implemented throughout buildings life cycle: from planning to design, construction, operation, maintenance, renovation, and demolition. This requires close cooperation of the contractor, the architects, the engineers, and the client at all project stages. The Green Building practice expands and complements the classical building design concerns of economy, utility, durability, and comfort at the same time rendering the building more efficient in utilization of renewable resources thereby reducing pollution. Kilifi being in the coastal area known for high humid temperatures, green building technologies including, wall plants / building plants, tilted designs and tilted façade to reduce thermal overheating by sun should be considered for individual buildings. There is need for Vipingo Development Limited to incorporate green building techniques in the individual projects during project design, construction, and operation phases.

11.2.2.7 Incorporating Non-Motorized Transport Facilities (NMT)

Non-motorised transport (NMT) is often a key element of successfully encouraging clean urban transport. It can be a very attractive mode of transport for relatively short distances, which make up the largest share of trips in urban areas. Vipingo Development Limited should aim to reverse the trend towards more private vehicle use is making non-motorised transport such as walking, skating, cycling, wheel chair use and use of scooters more attractive. This can be done by a range of activities including ensuring the master plan has provisions for construction of sidewalks and bike lanes, bike sharing programmes, urban planning and pedestrian-oriented development. NMT is a highly cost-effective transportation strategy and brings about large health, economic and social co-benefits, particularly for the urban dwellers. Notably NMT modes provide both recreation and transportation benefits and are especially important for short trips up to 7 kms, which take up the largest share of trips in most urban areas. Vipingo Development Limited should stimulate by a policy package consisting of investments in facilities, awareness campaigns, and incorporating smart urban planning. Specific ways to integrated non-motorised transportation in the proposed development are,

- Establish sidewalks, crosswalks, paths, bicycle lanes and networks.
- Public bicycle / scooters systems (automated bicycle / scooters rental systems designed to provide efficient mobility for short, utilitarian urban trips).
- Develop pedestrian oriented land use and building design.
- Ensure road and path connectivity, with special non-motorised shortcuts
- Traffic calming, streetscape improvements, traffic speed reductions, vehicle restrictions and road space reallocation
- Safety education, policies enforcement and encouragement programs.
- Design bicycle /. scooters parking and bicycle / scooters integration in transit systems (e.g., bicycle racks in metro or on bus)
- Address security concerns of pedestrians and cyclists.
- Vehicle parking policies

11.2.3 Recommended Need for Subsequent IEIAs

The Strategic Environmental Assessment (SEA) report has been prepared for the proposed Vipingo Mixed Use Development Master Plan, hence all developments and respective projects envisioned by the Master Plan must undergo individual Integrated Environmental Impact Assessment (IEIA) as per EMCA (Cap 387), and Environmental Impact Assessment (Assessment and Auditing) Regulations of the year 2003 (and subsequent amendments) (Legal Notice No. 101). The second schedule of EMCA (Cap 387), stipulates the ways in which Environmental Impact Assessment (EIA) should be undertaken and also provides details on projects that require EIA study to provide baseline information upon which subsequent Environmental Audits (EA) should be based.

11.2.3.1 Projects to undergo Environmental Impact Assessment

The second schedule of EMCA Cap 387 has categorised respective projects to undergo Environmental Impact Assessment according to risks. These include:

i. Low risk projects
ii. Medium risk projects
iii. High risk projects

All low risk and medium risk projects are required to undergo Environmental Impact Assessment whereas high risk projects require submission of environmental impact assessment study reports under section 58(2) of the Act. For all Low Risk and Medium Risk Projects, NEMA needs a Summary Project Report (SPR) of the likely environmental effect of the project. If the impacts are minimal, the

report shall be approved within 5 days or recommended for a Comprehensive Project Report (CPR) if the impacts are significant.

High Risk Projects shall require development of detailed Terms of Reference for comprehensive/ full study. As per the 2nd schedule of EMCA (Cap 387) high risk projects in general include an activity out of character with its surrounding; and any structure of a scale not in keeping with its surrounding. Further, as anticipated in the proposed Master Plan, major changes in land use; urban development including designation of new townships; transportation and related infrastructure projects including all new major roads such airports and airfields; must undergo an Environmental Impact Assessment study.

The proponent for all respective developments and projects which fall under the Second Schedule of EMCA Cap 387, as anticipated in the execution of Vipingo Mixed Use Development Master Plan will require to consult NEMA licenced environmental consultants/firms to ensure an EIA is undertaken for licensing purposes before works commence.

11.2.3.2 Key components for the EIAs

The respective EIAs will mainly aim at developing systems that should be environmentally friendly, economically viable and socially acceptable for sustainable development. To achieve these components, the EIAs will be undertaken as per Legal Notice No. 101. The following tasks should serve the minimum components for subsequent EIAs:

Task 1: ESIA Screening and Scoping

The consultant should undertake thorough screening of the project to identify its classification as per second schedule of EMCA Cap 387 and Legal Notice No. 101. Further, scoping should be conducted with the below forming minimum requirements; desktop studies, literature review, development and administration of checklists, identification and preliminary consultations with key stakeholders, reconnaissance trip to the project area and identification of key issues. The key issues that will emerge during the screening and scoping stage should be included in the EIA Report. In the case a full study is required, key issues should be highlighted in terms of reference (TORs) that should be developed for approval by NEMA. The TORs should outline the main outputs of the IEIA study and give provision for scoping the key issues identified and to be addressed in the main report.

Task 2: Description of the Proposed Project

The Consultant should provide a description of the relevant components of the project based on the existing baseline surveys and existing maps (at appropriate scale) where necessary and include the following information: location; general layout of activities / components, approaches, operations, required off-site investments; and life span. Further, the final project objectives should be outlined.

Task 3: Description of the Environment/ Baseline Surveys

The Consultant should assemble, evaluate and present baseline data on the relevant environmental characteristics of the study area. This task refers to baseline information which should include but not limited to below:

- The climate, habitat and vegetation, ecological assessment including site specific invertebrate assessment, soils, geology, demographic and settlement characteristics; the physical environment; historical archeological monuments and cultural heritage etc.
- The socio-economic profile of the area in terms of existing population trends, road and communication networks, key economic activities, etc.

This data will be generated using the methodology described above and field surveys using questionnaires. Secondary data sources like government institutions will be a supplement for this component.

Task 4: Analysis of the Legislative, regulatory and institutional framework

The consultant should describe the pertinent international, regional and national (NEMA) regulations and standards governing environmental quality, health and safety, protection of sensitive areas, protection of endangered species, sitting, land use control, etc., at international, national, regional and local (County) levels. This will set the environmental legal and institutional framework for future use by the management of the proposed project. The focus should be but not limited to EMCA CAP 387, Water Act 2016, Public Health Act, Occupational Safety and Health Act 2007, Vision 2030, County laws, and International Multilateral Environmental Agreements etc.

Task 5: Public Consultations and Inter-Agency Coordination

The consultant should assist in coordinating the environmental assessment with other government agencies, in obtaining the views of local people/ businesses, project affected persons/groups, and in keeping records of meetings and other activities, communications, and comments and their dispositions. Such activities should include: focus group meetings, environmental briefings for project staff and interagency committees, support to environmental advisory panels and public forums as need arises.

Task 6: Determination of the Potential Impacts

The consultant should analyze and distinguish between significant positive and negative impacts, direct and indirect impacts, and immediate and long-term impacts. Impacts which are unavoidable or irreversible should be identified. Wherever possible, description of impacts quantitatively, in terms of environmental costs and benefits should be undertaken and assigned economic values when and where feasible. The extent and quality of available data should be characterized, explaining significant information deficiencies and any uncertainties associated with predictions of impact. When describing the impacts, the consultant should indicate those that are irreversible or unavoidable and which should be mitigated. The consultant should also identify the types of special studies likely to be needed for the project in the future.

Task 7: Analysis of the Alternatives

The consultant should describe alternatives that should be examined during developing the proposed project and identify other alternatives which would achieve the same objectives. The concept of alternatives should extend to sitting, design, technology selection, implementation and phasing, and operating and maintenance procedures. Comparison of alternatives in terms of potential environmental impacts; capital and operating costs; suitability under local conditions; and instructional, training, and monitoring requirements should be done. To the extent possible, the costs and benefits of each alternative should be quantified incorporating the estimated costs of any associated mitigating measures. The consultant should include the alternative of not implementing the project, in order to demonstrate the environmental conditions without it.

Task 8: Development of Environmental and Social Management Plan to Mitigate Negative Impacts

The consultant should recommend feasible and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels. The impact and costs of those measures and of the institutional and training requirements to implement them should be estimated using current and project market prices of materials and services. Compensation to the affected parties (if any) for impacts which cannot be mitigated should be considered where need arises. A comprehensive environmental and social management plan including proposed work programs, budget estimates,

schedules, staffing and training requirements, and other necessary support services to implement the mitigating measure should be prepared.

Task 9: Development of Environmental Monitoring Plan
The consultant should prepare a detailed plan to monitor the implementation of mitigating measures and the impacts of the project during the whole cycle. Key parameters to be monitored and procedures should be identified clearly. An estimate of capital of operating costs and a description of other inputs (such as training and instructional strengthening) needed to carry out the monitoring should be included in the plan.

Task 10: IEIA Report Compilation

The IEIA report compilation should be a continuous exercise until the final submission. The environmental assessment report should be concise and limited to significant environmental and social issues. The main text should focus on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used in interpreting the data. Detailed or un-interpreted data should not be appropriate in the main text and should be presented in a separate volume. The final Integrated Environmental Impact Assessment report should be outlined as below.

Cover Page
Declaration by NEMA Integrated EIA Lead experts and the proponent
Table of contents/ List of Plates/ Tables/ Figures
Executive Summary
i. Introduction
ii. Description of the Proposed Project
iii. Description of the Environment/ Baseline Survey
iv. Policy, Legal and Administrative Framework
v. Public Consultation and Participation
vi. Significant Environmental and Social Impacts
vii. Analysis of Alternatives
viii. Environmental & Social Management Plan
ix. Environmental & Social Monitoring Plan
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Care should be taken to describe the IEIA process as clearly as possible. However, should any additional information become available or additional information be required, the process should be adapted accordingly. An Integrated Environmental Assessment approach is recommended to all future project specific EIAs. The Integrated EIA should include: Environmental Impact Assessment, Archeological Assessment, Social impact assessment, Health Impact Assessment, Cumulative Impact Assessment, Visual Impact Assessment, Climate Impact Assessment and Cultural Impact Assessment.

11.3 Recommended Way Forward

The SEA consultant recommends for approval of this SEA Report to proceed to the final SEA report. The development envisioned by Vipingo Mixed Use Master Plan will be of huge socio-economic benefits subject to implementation of the recommendations herein and those that the Authority may recommend to the proponent.

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APPENDICES

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